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PACIFIC ISLANDS

- VOLUME III

WESTERN PACIFIC
(TONGA TO THE SOLOMON ISLANDS)

December 1944

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NAVAL INTELLIGENCE DIVISION

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PREFACE

IN 1915 a Geographical Section was formed in the Naval Intelligence Division of the Admiralty to write Geographical Handbooks on various parts of the world. The purpose of these handbooks was to supply, by scientific research and skilled arrangement, material for the discussion of naval, military, and political problems, as distinct from the examination of the problems themselves. Many distinguished collaborators assisted in their production, and by the end of 1918 upwards of fifty volumes had been produced in Handbook and Manual form, as well as numerous short-term geographical reports. The demand for these books increased rapidly with each new issue, and they acquired a high reputation for accuracy and impartiality. They are now to be found in Service Establishments and Embassies throughout the world, and in the early years after the last war were much used by the League of Nations.

The old Handbooks have been extensively used in the present war, and experience has disclosed both their value and their limitations. On the one hand they have proved, beyond all question, how greatly the work of the fighting services and of Government Departments is facilitated if countries of strategic or political importance are covered by handbooks which deal, in a convenient and easily digested form, with their geography, ethnology, administration, and resources. On the other hand, it has become apparent that something more is needed to meet present-day requirements. The old series does not cover many of the countries closely affected by the present war (e.g. Germany, France, Poland, Spain, Portugal, to name only a few); its books are somewhat uneven in quality, and they are inadequately equipped with maps, diagrams, and photographic illustrations.

The present series of Handbooks, while owing its inspiration largely to the former series, is in no sense an attempt to revise or re-edit that series. It is an entirely new set of books, produced in the Naval Intelligence Division by trained geographers drawn largely from the Universities and working at sub-centres established at Oxford and Cambridge. The books follow, in general, a uniform scheme, though minor modifications will be found in particular cases; and they are illustrated by numerous maps and photographs.

The purpose of the books is primarily naval. They are designed first to provide, for the use of Commanding Officers, information in a comprehensive and convenient form about countries which they may be called upon to visit, not only in war but in peace-time; secondly, to maintain the high standard of education in the Navy and, by supplying officers with material for lectures to naval personnel ashore and afloat, to ensure for all ranks that visits to a new country shall be both interesting and profitable.

Their contents are, however, by no means confined to matters of purely naval interest. For many purposes (e.g. history, administration, resources, communications, etc.) countries must necessarily be treated as a whole, and no attempt is made to limit their treatment exclusively to coastal zones. It is hoped therefore that the Army, the Royal Air Force, and other Government Departments (many of whom have given great assistance in the production of the series) will find these Handbooks even more valuable than their predecessors proved to be both during and after the last war.

J. H. GODFREY,
Director of Naval-Intelligence
1942

The foregoing preface has appeared from the beginning of this series of Geographical Handbooks. It describes so effectively their origin and purpose that I have decided to retain it in its original form.

This volume has been prepared for the Naval Intelligence Division at the Cambridge sub-centre (General Editor, Dr H. C. Darby). It has been mainly written by Mr A. E. P. Collins, Dr J. W. Davidson, Mr Adrian Digby and Dr Raymond Firth, with contributions from Dr P. W. Richards. The maps and diagrams have been drawn mainly by Miss K. S. A. Froggatt and Miss F. Hands. The volume has been edited by Dr Raymond Firth, assisted by Dr J. W. Davidson.

E. G. N. RUSHBROOKE,
Director of Naval Intelligence

December 1944

CONTENTS

PREFACE	PAGE iii
SUMMARY OF CONTENTS OF HANDBOOK ON PACIFIC ISLANDS	viii
LIST OF MAPS AND DIAGRAMS	ix
LIST OF PLATES	xv
I. INTRODUCTION	I
Limits and Size of the Region: Diversity of Island Groups and Peoples: Economic and Political Characteristics in 1939: Plan of this Volume: Source Literature and Maps: Place-names	
II. TONGA	14
Physical Geography: History: Growth and Distribution of Population: The People	
III. TONGA (<i>cont.</i>)	69
Government: Social Services: Economics: Ports: Communications: Tongatapu Group: Ha'apai Group: Vava'u Group: Northern Islands: Bibliographical Note	
IV. GENERAL REVIEW OF THE FIJI GROUP	114
Physical Geography: History: Composition and Distribution of Population: Peoples	
V. THE FIJI GROUP (<i>cont.</i>)	170
Government: Social Services: Economics: Ports and Settlements: Communications: Bibliographical Note	
VI. INDIVIDUAL ISLANDS OF THE FIJI GROUP	233
Viti Levu: Vanua Levu: Kandavu: Taveuni: Lomaiviti Group: Yasawa Group: Lau Group	
VII. ROTUMA, UVEA AND FUTUNA	266
Rotuma: Uvea (Wallis Island): Futuna and Alofi (Hoorn Islands): Bibliographical Note	

VIII	GILBERT ISLANDS, ELLICE ISLANDS, OCEAN ISLAND AND NAURU	PAGE 302
	Physical Geography: History: Population Density and Trend: The Native People: Administration: Social Services	
IX.	GILBERT ISLANDS, ELLICE ISLANDS, OCEAN ISLAND AND NAURU (<i>cont.</i>)	348
	Economics: Ports: Communications: Nauru: Ocean Island: Gilbert Islands: Ellice Islands: Bibliographical Note	
X.	THE KERMADECS, NORFOLK, AND LORD HOWE	386
	The Kermadec Islands—Raoul (Sunday) Island, Macauley Island, Curtis and Cheeseman Islands: Norfolk Island: Lord Howe Island: Bibliographical Note	
XI.	NEW CALEDONIA	414
	Physical Geography: History: Growth and Composition of Population: Native People: Administration: Social Services	
XII.	NEW CALEDONIA (<i>cont.</i>)	463
	Economics: Ports and Settlements: Communications: Isle of Pines: Loyalty Islands: Other Dependencies: Bibliographical Note	
XIII.	GENERAL REVIEW OF THE NEW HEBRIDES	511
	Physical Geography: History: Peoples: Administration: Social Services: Economics: Ports and Settlements: Communications	
XIV.	INDIVIDUAL ISLANDS OF THE NEW HEBRIDES	573
	Efate: Malekula: Espiritu Santo: Shepherd Islands: Epi: Paama and Lopevi: Ambrim: Raga and Maewo: Omba: Banks Islands: Torres Islands: Southern Islands	
	Matthew and Hunter Islands	
	Bibliographical Note	
XV.	GENERAL REVIEW OF THE SOLOMON ISLANDS	607
	Physical Geography: History: Peoples: Administration: Social Services: Economics: Ports and Settlements: Communications	

XVI. INDIVIDUAL ISLANDS OF THE SOLOMONS 667

Northern Atolls: Buka: Bougainville: Shortland Islands and
Treasury Islands: Choiseul: New Georgia Group

Ysabel: Russell Islands: Nggela: Malaita: Sikaiana: Guadalcanal:
San Cristobal

Rennell and Bellona: Santa Cruz Group and Outlying Islands

Bibliographical Note

APPENDICES:

- I. Maps and Charts of the Western Pacific (Tonga to the
Solomon Islands) 700
- II. Place-names in the Western Pacific (Tonga to the
Solomon Islands) 707
- III. The Western Pacific Islands (Tonga to the Solomon
Islands), 1939-44 710

INDEX 713

SUMMARY OF CONTENTS OF HANDBOOK ON PACIFIC ISLANDS

VOLUME I. GENERAL SURVEY

Geology and Physical Structure; Climate; Vegetation; Fauna; Health; History; Peoples; Administration; Economics; Ports and Communications

VOLUME II. EASTERN PACIFIC

Outlying Islands; Society Islands; Tuamotu Archipelago; Mangareva Group, Austral Islands and Rapa; Marquesas; Hawaiian Islands; Central Equatorial Islands; Tokelau Group, Cook Islands and Niue; Samoa

VOLUME III. WESTERN PACIFIC

(TONGA TO THE SOLOMON ISLANDS)

Tonga; Fiji; Rotuma, Uvea and Futuna; Gilbert Islands and Ellice Islands; Nauru; Kermadecs, Norfolk and Lord Howe; New Caledonia; New Hebrides; Solomon Islands

VOLUME IV. WESTERN PACIFIC

(NEW GUINEA AND ISLANDS NORTHWARD)

New Guinea (Mandated Territory and Territory of Papua); Bismarck Archipelago; Caroline Islands; Marshall Islands; Wake Island; Guam; Marianas; Bonin Islands

LIST OF MAPS AND DIAGRAMS

	PAGE
1. Main shipping routes in the Western Pacific in 1939	<i>facing</i> 2
2. Political control of the Western Pacific islands in 1939	<i>facing</i> 3
3. Key to general symbols used on maps	10, 11
4. The Tonga group, showing its relation to neighbouring islands and groups	14
5. Geology of islands of the Tonga group	16
6. Geology of 'Eua, Tonga	19
7. 'Eua, Tonga: geological section	20
8. Fonuafo'ou (Falcon Island), Tonga, in 1889	24
9. Fonuafo'ou (Falcon island), Tonga, in 1928	26
10. Fonuafo'ou (Falcon island), Tonga; profiles during half a century	27
11. Monthly temperature and rainfall, Nuku'alofa, Tonga, 1929-33	33
12. Annual rainfall, Tongatapu, 1917-40	33
13. Mean annual rainfall in major islands of the Tonga group, 1932-40	35
14. Monthly rainfall, Nuku'alofa, Tonga, 1929-40	35
15. Growth of Tongan population, 1840-1939	48
16. Tongan birth and death rates, 1922-38	49
17. Distribution of population in Tongatapu, 1931	52
18. Sketch plan of Pangai, a Tongan village	57
19. Ha'amonga'a Maui, Tongatapu	67
20. Export of copra from Tonga, 1911-40	80
21. Export of bananas from Tonga, 1930-40	81
22. Estates in Tongatapu	83
23. Tongatapu: roads and principal settlements	<i>facing</i> 86
24. Neiafu harbour, Vava'u	<i>facing</i> 87
25. 'Eua, Tonga: relief and settlement	94, 95
26. Ha'apai: major islands of the northern group	97
27. Nomuka, Tonga	101
28. Vava'u; physical	<i>facing</i> 104
29. Vava'u: roads and principal settlements	<i>facing</i> 105
30. Niuauputapu and Tafahi, Tonga	109
31. Niuafo'ou, Tonga	110
32. Niuafo'ou, Tonga: profile structure section	111
33. Landing at Angaha, Niuafo'ou	111
34. The Fiji group	114
35. Geological sketch map of Viti Levu	116
36. Mango, Fiji: geological plan and section	117
37. Winds at Suva, 1936	120
38. Monthly temperatures, Suva, 1939	120
39. Rainfall at selected stations, Fiji	121

	PAGE
40. Rainfall dispersion by months, Suva, 1910-38	122
41. Annual rainfall, Suva, 1910-38	123
42. Vegetation of the main islands, Fiji	125
43. Density and distribution of total population in the main islands, Fiji	142
44. Density and distribution of native Fijian population in the main islands, Fiji	143
45. Density and distribution of Indian population in the main islands, Fiji	144
46. Fijian and Indian population, 1891-1940	145
47. Fijian birth and death rates, 1915-40	146
48. Age-groups of Fijians, Indians, mixed-bloods and Europeans in Fiji	147
49. Sketch plan of Tokalau village, Kambara, Fiji	151
50. Fiji: district boundaries (before September 1938)	173
51. Fiji: district boundaries (since September 1938)	174
52. Fiji: revenue and expenditure, 1875-1940	175
53. Fiji: provinces	181
54. Land utilization in Fiji (1)	196
55. Land utilization in Fiji (2)	199
56. Sugar-cane production and acreage, Fiji, 1915-40	201
57. Export of sugar, Fiji, 1915-40	202
58. Export of bananas, Fiji, 1915-40	203
59. Export of copra, Fiji, 1915-40	209
60. Changes in foreign trade of Fiji between 1915 and 1938	210
61. Suva	<i>facing</i> 212
62. Lautoka	<i>facing</i> 216
63. Levuka	<i>facing</i> 217
64. Lautoka sugar mill	217
65. Vatukoula in 1939	222, 223
66. Viti Levu and Vanua Levu: railways and regular local shipping services	224
67. Viti Levu and Vanua Levu: roads and tracks	227
68. The Rewa bridge, Viti Levu	228
69. Viti Levu: relief	234
70. Viti Levu: drainage	236
71. Viti Levu: Rewa coast	<i>facing</i> 238
72. Viti Levu: Mba coast	<i>facing</i> 239
73. Malake island and Navuavua (about 1876)	239
74. Cliffs on the east side of Mbengga	243
75. Vanua Levu: relief	244
76. Vanua Levu: drainage and hot springs; settlements	245
77. Kandavu	249
78. Yasawa group	255
79. Lau group: geology	257
80. Totoya	258
81. Exploring isles and adjacent islands	260
82. Cañon on the east shore of Nggilanggila island	261

	PAGE
83. Weathered limestone rocks on the shore of Mango	262
84. Rotuma	267
85. Rotuma: monthly rainfall	269
86. Uvea (Wallis island)	277
87. Futuna and Alofi (Hoorn islands)	291
88. Gilbert islands, Ellice islands, Ocean island and Nauru	302
89. Nauru: physical	304
90. Nauru: sections through beaches	306
91. Monthly temperatures, Ocean island, 1905-28	308
92. Comparative annual rainfall, Gilbert and Ellice islands, 1924-30 and 1934	309
93. Annual rainfall, Ocean island, 1909-38	310
94. Annual rainfall, Nauru, 1915-40	311
95. Comparative monthly rainfall in three islands of the Gilbert and Ellice Islands Colony, 1926-33	312
96. Vaitupu, Ellice islands	337
97. Phosphate export, Ocean island, 1915-6 to 1938-9	352
98. Phosphate export, Nauru, 1916-40	353
99. Copra export, Gilbert and Ellice Islands Colony, 1915-6 to 1938-9	357
100. Nauru: land utilization	364
101. Nauru: communications and settlements	365
102. Ocean island	367
103. Butaritari, Abaiang, Maiana and Abemama (Gilbert islands)	369
104. Butaritari: the main island	371
105. Tarawa, Gilbert islands	373
106. Marakei, Kuria and Aranuka (Gilbert islands)	374
107. Onotoa, Beru and Nonouti (Gilbert islands)	376
108. Tabiteuea, Gilbert islands	377
109. Nikunau and Tamana, Gilbert islands	379
110. Nukufetau and Nukulaelae, Ellice islands	381
111. Kermadec islands	386
112. Curtis island crater	387
113. Norfolk island	395
114. Norfolk island: temperature and rainfall	397
115. Lord Howe island	407
116. New Caledonia: reef system	414
117. New Caledonia: geology	416
118. New Caledonia: relief	418
119. New Caledonia: drainage	418
120. New Caledonia: coastal features	420
121. Cliffs at Goro	421
122. Cape Ndoua	421
123. Mount Dore	422
124. Ducos peninsula	422
125. Poya	423
126. Ouaco	424

	PAGE
127. Hienghène bay	427
128. Limestone pinnacles near Hienghène	427
129. Cape Laugier	428
130. Thio delta	429
131. Tonnedou delta and adjacent coast	430
132. East coast near Yaté	431
134. Annual distribution of winds at Noumea, 1935-8	434
135. Monthly variation of winds at Noumea, 1935-8	435
136. Monthly temperatures, Noumea	436
137. Annual rainfall, Noumea, 1879-1914	437
138. Average monthly rainfall at selected stations in New Caledonia	438
139. New Caledonia: forest areas	441
140. New Caledonia: north-western part (with general key) <i>between</i>	448-9
141. New Caledonia: Pam-Ouaco	" "
142. New Caledonia: Hienghène-Népoui	" "
143. New Caledonia: Ponérihouen-Bourail	" "
144. New Caledonia: Kouaoua-Bouloupari	" "
145. New Caledonia: Comboui-Noumea	" "
146. New Caledonia: south-eastern part	" "
147. New Caledonia: Isle of Pines	" "
148. Ceremonial masks, New Caledonia	456
149. Doorpost slabs, New Caledonia	457
151. New Caledonia: principal mining centres	464
152. Export of nickel <i>matte</i> , New Caledonia, 1925-39	468
153. Tiébaghi massif, New Caledonia	469
154. Export of chromite, New Caledonia, 1925-39	471
155. Export of coffee (compared with native production), New Caledonia, 1921-39	476
156. Export of copra (compared with native production), New Caledonia, 1925-39	477
157. Trade relations of New Caledonia	486
158. Noumea: port plan	<i>facing</i> 486
159. Noumea, New Caledonia	<i>facing</i> 487
160. Thio delta, New Caledonia	491
161. New Caledonia: main road system	494
162. Mare, Loyalty islands	499
163. Lifu, Loyalty islands	500
164. Uvea, Loyalty islands	501
165. The New Hebrides	512
166. Section from cape Tsinone to Laiiriri, south-west Espiritu Santo	514
167. Section at Steep gully, Havannah harbour, Efate	515
168. Winds at Vila	518
169. Monthly temperatures, Vila	519
170. Annual rainfall at four stations in the New Hebrides	520

	PAGE
171. Monthly rainfall, Vila and Hog harbour	521
172. Distribution of graded societies in the New Hebrides	540
173. Village in Seniang district, Malekula	543
174. Pudding spoon	547
175. Wooden mask from Omba	548
176. Head with tusks from Malekula	549
177. Mask from Malekula	550
178. Figure of a dog	551
179. Export of copra from the New Hebrides, 1920-38	563
180. Export of cocoa from the New Hebrides, 1920-38	564
181. Proportionate value of New Hebrides exports, 1920-38	566
182. External trade of the New Hebrides, 1938	567
183. Vila	<i>facing</i> 568
184. Segond and Bruat channels	<i>facing</i> 569
185. Efate	574
186. Malekula: physical	578
187. Malekula: social	579
188. Espiritu Santo	583
189. Tongariki and Buninga: profile from the south-east	586
190. Epi	588
191. Ambrim	589
192. Raga and Maewo	591
193. Omba	593
194. Gaua	595
195. Vanua Lava	596
196. Torres islands	599
197. Aneityum	600
198. Eromanga and Tana	602
199. Traitor's Head, Eromanga	603
200. The Solomon islands	608
201. Buka: geology	610
202. Winds at Tulagi	614
203. Monthly temperatures, Tulagi, 1899-1939	615
204. Annual rainfall, Tulagi, 1911-40	615
205. Rainfall dispersion by months, Tulagi, 1911-22, 1924-40	616
206. Rainfall dispersion and rain-days at Shortlands and Kieta	617
207. Fishing-float from the southern Solomons	642
208. Canoe figure-head from New Georgia	643
209. British Solomon Islands Protectorate: administrative districts	647
210. Export of copra, British Solomon Islands Protectorate	657
211. Export of trochus shell, British Solomon Islands Protectorate	659
212. External trade, British Solomon Islands Protectorate	661
213. Tulagi and Gavutu harbours	<i>facing</i> 662
214. Ontong Java	669
215. Bougainville and Buka	671
216. Shortland islands and Treasury islands	673

	PAGE
217. Choiseul	674
218. Plantations at Choiseul bay	675
219. New Georgia group	677
220. Ysabel	681
221. Nggela	684
222. Malaita	686
223. Guadalcanal	688
224. San Cristobal	690
225. Rennell	692
226. Santa Cruz group and neighbouring islands	694
227. Tikopia	696

LIST OF PLATES

	FACING PAGE
1. North coast of Vava'u, Tonga	22
2. Vaipu'ua inlet, Vava'u	22
3. Neiafu harbour, Vava'u	23
4. A road in Tonga	23
5. North-east coast of Vava'u	30
6. Blowholes, Tongatapu	30
7. Pangaimotu island, Vava'u	31
8. Angaha, Niuafo'ou	31
9. Royal Palace, Nuku'alofa, Tonga	106
10. Levuka in 1879	106
11. View in the north of Viti Levu	107
12. Nandarivatu, Viti Levu	107
13. Cliff on the west coast of Vatu Lele	118
14. Beach on the north shore of Komo, Lau islands	118
15. Mbengga harbour	119
16. Native Fijian	152
17. A Polynesian of Tikopia (Solomon islands)	152
18. Namosi village, Viti Levu	153
19. Beating gongs	153
20. Banana-packing station on the Waindina river	194
21. Indian farm, near Lambasa, Vanua Levu	194
22. Locomotive on the C.S.R. Company's railway, Lautoka	195
23. Sugar mill at Lautoka	195
24. Suva from the air.	214
25. King's Wharf, Suva	215
26. Suva: small craft in Numbukulou creek	215
27. The main street, Levuka	218
28. Wharves, Levuka	218
29. House-building at Somosomo, Taveuni	218
30. Suva harbour	219
31. The Singatoka bridge	219
32. The Rewa river, Viti Levu	252
33. The Navua river, Viti Levu	252
34. Makongai: the southern coast	253
35. Makongai: the main leper settlement	253
36. Butaritari, Gilbert islands	314
37. Modern sailing canoe at Funafuti, Ellice islands	314
38. Limestone pinnacles on the reef, Nauru	315
39. Anibare bay, Nauru	315
40. Western side of Nauru	332
41. A corner of Buada lagoon, Nauru	332

42.		
43.	Houses at Vaitupu, Ellice islands	333
44.		
45.		
46.		
47.	Bonito fishing, Vaitupu	354
48.		
49.	Part of a worked-out phosphate field, Nauru	355
50.	Breakwater, Nauru	355
51.	Cantilever pier, Nauru	360
52.	Cantilever pier, Nauru, from the sea	360
53.	Cantilever pier, Ocean island	361
54.	Discharging oil, Ocean island	361
55.	Phillip and Nepean islands	398
56.	Norfolk island from the air	398
57.	Coastal cliffs, Norfolk island	399
58.	Kingston, Norfolk island	399
59.	Lord Howe island	408
60.	Collecting palm seed, Lord Howe island	409
61.	The lagoon, Lord Howe island	409
62.	Ouenghi river, New Caledonia	432
63.	Houailou river, New Caledonia	432
64.	St Vincent bay, New Caledonia	433
65.	Paagoumène, New Caledonia	433
66.	Country near Bourail, New Caledonia	452
67.	Ousaco, New Caledonia	452
68.	St Louis Mission, New Caledonia	453
69.	Native village, New Caledonia	453
70.	Tiébaghi mine, New Caledonia	466
71.	Goro, New Caledonia	466
72.	Doniambo point, Noumea, New Caledonia	467
73.	La Forestière sawmill, New Caledonia	467
74.	General view of Noumea, New Caledonia	488
75.	Southern part of Noumea	489
76.	Strand trees at Whitesands, Tana	
77.	Wet forest at Tesman bay, Malekula	522
78.	Land near Yasur, eastern Tana	523
79.	Lolowai bay, Omba	523
80.		
81.	Coastal scenery, Banks and Torres islands	526
82.		
83.	A Melanesian of Malekula	527
84.	Deformed boars' tusks	527
85.	A Banks islands house	552
86.	Gongs and screen in a Senieng village, Malekula	552
87.	Vila, Efate	553
88.	Vila harbour	553
89.	The south end of Vila	576

	FACING PAGE
90. A coconut plantation at Vila	576
91. Marau sound	577
92. The Segilau river, Guadalcanal	577
93. Group of natives, Bellona	612
94. The Pachu river, Choiseul	612
95. Mana Kwoi, Malaita	613
96. Creek at Roas bay, Malaita	613
97. } A young man of Ontong Java	630
98. }	
99. Native drilling shell-money	631
100. Native of Santa Catalina	631
101. Gamal house, south-east Solomon islands	634
102. Carved posts from an old gamal house, Ugi	634
103. Islet of Tendao, off Vella Lavella	635
104. Sisieta village, Roviana lagoon	635
105. Beach at Pamua, San Cristobal	638
106. Canoe at Roviana	638
107. Artificial island, Malaita	639
108. Petats island: bringing in fish	639
109. Ceremonial shields	644
110. Wooden food bowl, Solomon islands	644
111. Tulagi: waterfront	645
112. Tulagi: Chinatown	645
113. Kieta harbour from the southern entrance	664
114. Faisi from the south-east	665
115. Roviana lagoon, New Georgia	665
116. Utuha passage, Nggela	682
117. Anchorage, Liapari plantation, Vella Lavella	682
118. } Halavo and Honggo villages, Nggela	683
119. }	
120. Auki, Malaita	686
121. Tikopia: the south-east coast	686
122. Sikaiana: houses in lagoon	687
123. Sikaiana: modern type of house construction	687
124. Road on the north coast of Bougainville	690
125. Village on Santa Ana	690
126. Graciosa bay, Ndeni	691
127. Te Motu village, Ndeni	691



Chapter I

INTRODUCTION

Limits and Size of the Region: Diversity of Island Groups and Peoples: Economic and Political Characteristics in 1939; Plan of this Volume: Source Literature and Maps: Place-names.

LIMITS AND SIZE OF THE REGION

Geographically or politically the Western Pacific is not a clearly demarcated region. A broad distinction, however, can be drawn between it and the Eastern Pacific, especially as regards its resources and population. The term Western Pacific may bear several meanings. Geographically it is sometimes applied to the area west of the 180th meridian and including all the islands and island groups as far west as the borders of the continents of Australia and Asia. Politically, however, the term is usually applied in a more restricted sense; the tendency is to regard the Philippine islands and the Indonesian islands as more properly part of the Asiatic area. Moreover, a different and very specific political significance is involved in the use of the term Western Pacific High Commission. The territories under the jurisdiction of the High Commissioner include not only some groups west of the 180th meridian but also the Phoenix group and some other islands well to the east of the meridian. For the purposes of this Handbook the Western Pacific may be defined roughly as the area west of the international date line extending as far as the east coast of Australia, the west coast of New Guinea, and (north of the equator) long. 130° E; the northern and southern boundaries are approximately lat. 30° N and 30° S. This is essentially an island region, excluding such major entities as Japan, the Philippine islands and New Zealand. But it includes New Guinea, which is ordinarily regarded as one of the Pacific islands proper.

This Western Pacific area, though considerably less in magnitude than the Eastern Pacific (vol. II, p. 1), is still of great extent. It measures some 3,500 miles from north to south and approximately as much in greatest width from east to west. In this area of nearly 9,000,000 sq. miles less than 400,000 sq. miles is occupied by land, and of this about 90 per cent. is represented by New Guinea. As compared with the Eastern Pacific the islands as a whole are more numerous—in the Caroline group alone, for example, there are

said to be 549 islands—with shorter distances between many of them; nevertheless until developments consequent upon the Japanese aggression many of them were very isolated.

Through the region in normal times run a number of important shipping routes (Fig. 1). One series connects Australia and New Zealand with North America, using Suva as a major port of call; another series, passing near New Guinea, links Australia with Indonesia and the Asiatic mainland; and a third series links Japan, the Philippines and the Asiatic mainland with Honolulu and North America. In addition, Australia, New Zealand and Japan each has shipping routes of a more local type, serving the island territories most closely connected with them by economic and political ties. On the whole, compared with the Eastern Pacific, distances between ports in the Western Pacific are not so great, and while there is no one Western Pacific port equal in importance to Honolulu (vol. II, pp. 392-400), there are more ports of moderate capacity well distributed throughout the area. Most important are Suva, Noumea, Rabaul, Port Moresby, Koror and Saipan. But others such as Lautoka, Nuku'alofa, Vila, Tulagi, Samarai, Salamaua, Kavieng, Truk and Jaluit also serve ocean-going vessels; and some are capable of considerable development.

Until a few years ago air communication in the Western Pacific area was only moderately developed. Pan-American Airways had established a regular service between Honolulu and Auckland, with Noumea as an intermediate airport (Suva was added in 1941); and Guam and Wake Island had been developed earlier as airports *en route* between Honolulu and Manila. An air service connected Japan with the Marianas, Caroline and Marshall groups. There was also an air mail service between Australia and New Guinea, and a highly developed air-freight service between points on the coast and in the interior of New Guinea. The latter was established in the first instance to cater for the needs of the new goldfields, which were almost inaccessible by land. But many of the islands and groups were still without air communication.

Two important Pacific cables cross the area. In the south the cable from Vancouver runs to Fiji and thence to Norfolk island, whence it branches to New Zealand and to Queensland. In the north the cable from San Francisco through Honolulu and Midway runs to Guam, whence it branches through the Bonin islands to Japan, to the Philippines and to Yap; from Yap it branches again to Shanghai and to the Netherlands East Indies.



Fig. 1. Main shipping routes in the Western Pacific in 1939

Distances are approximate, in nautical miles. The main through routes are shown in solid red line; the principal short-distance routes linking mainland territories with neighbouring islands or groups are shown in pecked red line. Trans-Pacific services from Australia and New Zealand, and many local services, are omitted. West of New Guinea only main trends are shown. Based on official and commercial sources.

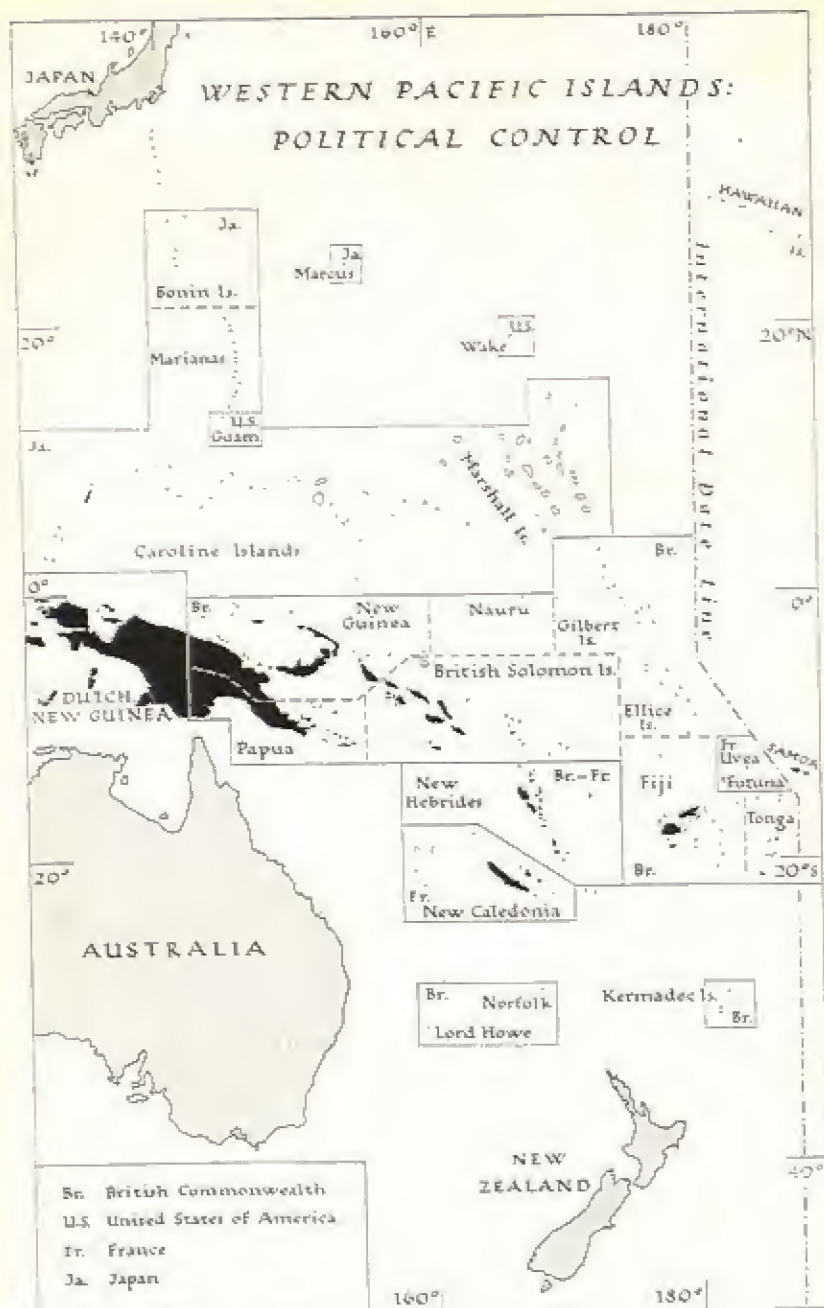


Fig. 2. Political control of the Western Pacific islands in 1939

The lines separating the various groups do not necessarily indicate extent of sovereignty. The open figures or rings (as in the Marshall islands) represent major atolls.

DIVERSITY OF ISLAND GROUPS AND PEOPLES

Islands

The Western Pacific, like the Eastern Pacific, is mainly tropical in character, but it presents a greater diversity of islands. There is the same general contrast between the high islands, primarily of volcanic formation, and the low islands, primarily of coral formation. Broadly speaking, the high islands stretch in a wide arc through the west of the region. They have comparatively heavy rainfall, fertile soil and a luxuriant vegetation. The main groups of low islands—the Marshall islands, the Gilbert islands and the Ellice islands—lie more to the east. They comprise many atolls and form part of a great belt which is oriented in a north-west and south-east direction and is in effect a continuation of that formed in the Eastern Pacific by the Phoenix islands, the Northern Cook group and the Tuamotu archipelago. In all these atolls rainfall is apt to be light and irregular, water is often scarce, and the vegetation is limited to a few types of plants, the most prominent being usually coconut and pandanus.

While it has many groups of islands with only small populations and few resources, the Western Pacific, unlike the Eastern Pacific, includes one great land mass of continental type, New Guinea, with a large population and considerable agricultural and mineral resources. Despite its proximity to Australia and its fairly long history of European contact New Guinea is so large and so rugged in the interior that large areas of it are still almost unexplored. In the Eastern Pacific there is no comparable *terra incognita*.

The total population of the Western Pacific area is not accurately known, but is probably about 1,850,000; of this about 1,650,000 are natives, the remainder being Europeans and Asiatics.

Peoples

The Western Pacific area presents a much greater diversity of native peoples than does the Eastern Pacific. Polynesians closely akin to those of the latter region inhabit Tonga, the Ellice islands, Uvea, Futuna, Rotuma and a few small outlying islands on the eastern fringe of the Solomons and New Hebrides. Melanesians of various types occupy Fiji, New Caledonia, the major islands of the New Hebrides and Solomons, some of the coastal areas of eastern New Guinea and most of the islands off the north-east and east of New Guinea. Papuans occupy the western coasts of New Guinea and much of the interior, while Negritos, some of whom are of such small

stature as to be classed as pygmies, live in the isolated high central New Guinea mountains, especially in Netherlands territory. (Many of the mountain peoples appear to be a mixture of Negrito and Papuan.) Micronesians occupy the island groups in the north of the Western Pacific area, such as the Gilbert islands, Marshall islands and Caroline islands. The Chamorro, a people of Micronesian type, now very much mixed with white and Filipino blood, are found in the Marianas, particularly in Guam. Taken as a whole, these groups of people show a great variety of physical type and of language; the essential unity characteristic of the Eastern Pacific is lacking.

There are also wide differences in the culture of the people. Here the influence of natural environment is often very apparent. In the great atoll region of the Marshall, Gilbert and Ellice islands, for instance, the limitations on agriculture and the close association with the sea have produced cultures in which reliance is placed primarily on coconut and pandanus for vegetable food and great use is made of canoes and deep-sea fishing technique. As a result the way of life of the people throughout this region, whether Polynesians or Micronesians, is very similar. But in many of the large high islands, especially in New Guinea, the range of environment is much greater and communication is much more hampered than it is between neighbouring atolls; the tendency has been therefore for much more specialized local cultures to develop. There is commonly a great difference here in way of life and social institutions between the coastal ('saltwater') people and the inland ('bush') people, and despite the improvement of communications and pacification of territories in recent years there is often still a strong distrust between them. The influence of the dominant food supply is often very marked; not only seasonal occupations and the division of labour but also forms of exchange and of land tenure, ceremonial proceedings at marriage, myths, legends and religious beliefs, all show its effects. There is very great contrast, for example, between the cultures of the people of many of the islands to the south-east of New Guinea (where the yam or the taro is a major foodstuff and the domestic pig is of great importance), the cultures of the people in the centre and west of the Gulf of Papua (where the huge sago swamps provide the main food), and those of the people of savannah regions to the west of the Fly river (where the climate does not always favour agriculture, and hunting and collecting are sometimes the primary occupations). Differences in natural resources have led in many cases to extensive native trade, either by barter or by ceremonial exchange, not only

in food but also in shells and other ornaments and in manufactured articles such as pots and canoes. Much of the trade is between coastal and inland districts, but much of it also takes place by sea, and certain peoples such as the Motu of Port Moresby, the Tami and Siassi of islands off eastern New Guinea, and the Manus of the Admiralty islands are noted as traders. Such trading connections, often between peoples who otherwise live in a state of semi-hostility, have done much to mitigate tribal isolation and to spread material equipment, knowledge of technique, and even forms of social institutions over wide areas.

Before the coming of Europeans the Western Pacific peoples had not reached a high level of material technique—they used tools of wood, stone and shell, and were ignorant of the use of metals. But some other aspects of their culture were more highly developed in certain areas. In political organization and chieftainship Tonga and Fiji had elaborate structures, which still largely function in modern conditions. In social institutions the kava drinking of Tonga and the men's graded societies ('clubs') of the New Hebrides are examples of very complex sets of relationships and patterns of behaviour. In decorative art, the geometrical curvilinear designs of the Massim people of eastern New Guinea and the anthropomorphic and zoomorphic sculpture of some of the Solomon islanders and of the Sepik river people of northern New Guinea show a high degree of craftsmanship and aesthetic perception. These are but a few examples of ways in which the native peoples have developed one or other aspect of their culture and by so doing created and maintained things which have given value and meaning to their particular way of life.

Influence of Western Civilization

But in the last half-century, in particular, the native cultures of the Western Pacific area, as elsewhere, have been subjected with increasing intensity to the influence of Western civilization. Partly depending on their degree of isolation and on the attitudes of resistance or acceptance, they have come to differ widely in the extent to which they have adopted the new elements. At one end of the scale are the people of Tonga and Fiji, whose more highly educated members are thoroughly equipped with a knowledge of the Western world, participate in the government of their communities, and are capable of mastering all the complexities of modern economic and social organization. At the other end of the scale are some of the peoples of the interior of New Guinea, still virtually in the stone age

and able to manage only their own traditional primitive institutions. In between are the great mass of island peoples, many with some degree of education in their own vernacular, using steel tools, European cloth and (when they can afford them) some staple imported foods and a small range of other foreign goods. Although they usually carry on a way of life which is still 'native' in many respects and often play little or no part in the wider spheres of administration, of government and social services, their contact with civilization has left its mark—on their health and their housing, their political systems and their religion—and has often created serious problems of adjustment to the new conditions.

The role of Europeans and Asiatics in the Western Pacific varies greatly from one island group to another. In all they number rather more than 200,000, but they are distributed very unevenly. New Caledonia has a comparatively large French population of long standing, and Fiji and New Guinea have each several thousand British residents, but in New Guinea most are of fairly recent settlement. Elsewhere the number of Europeans is small and in general the majority of these have not made the islands their permanent home. Apart from some thousands of Javanese and Indo-Chinese, mostly labourers in the areas under French administration and in the New Hebrides, the two areas of Asiatic penetration are Fiji and the Japanese mandated islands. In Fiji the Indians, originally brought in as indentured labourers for the sugar plantations, have now established themselves as farmers, traders and small craftsmen, and their natural increase of population has now made them approximately equal in numbers to the native Fijians. In the Marianas, Caroline and Marshall islands, Japanese, who in 1919 were only a few hundred, by 1939 formed three-fifths of the total population.

ECONOMIC AND POLITICAL CHARACTERISTICS IN 1939

In the economic sphere the main wealth of most of the Western Pacific, as of the Eastern Pacific, lies in agriculture. Apart from subsistence crops, copra is the only item of any consequence in most groups, but Fiji and Saipan have a large-scale production and export of sugar. Cocoa (in the New Hebrides), coffee (in New Caledonia, the New Hebrides and Papua), rubber (in Papua) and bananas (in Fiji and Tonga) are of some economic importance. Most of the bananas and some of the coffee are grown by native producers.

In nearly all islands natives produce most of the copra by small-scale methods. But the other cash crops are generally not in native hands.

A marked feature of some Western Pacific islands is their mineral resources, which those of the Eastern Pacific in no way rival. The extraction of gold (in New Guinea and Fiji), of nickel, chromite and iron (in New Caledonia), and of phosphate (in Nauru, Ocean island and Angaur), and the search for oil (in New Guinea) have created technological and economic situations very different from those of the agricultural areas. External capital on a large scale has been put into mining, often by international organizations—in contrast to agriculture, which for the most part has been financed and controlled either by local interests or by trading and shipping companies of a semi-local character, usually with headquarters in the nearby Dominions.

In the political sphere the area presents a diversity of sovereignties and still more of administrative systems. Though Spain annexed the Marianas group in 1686 and the Dutch acquired a nominal cession of western New Guinea in 1714, it was not until about the middle of the nineteenth century that most of the area began to be of much political importance to the Western Powers. France acquired New Caledonia in 1853, to serve as a penal settlement, and Britain after initial refusal annexed Fiji in 1874. As late as 1883 Britain repudiated the action of the Queensland government in establishing formal control over south-eastern New Guinea. But the colonial ambitions of Germany were rising, and in 1884 German annexation of New Britain, New Ireland and the north-east coast of New Guinea was proclaimed. In the same year Great Britain established a protectorate over south-eastern New Guinea, in 1892 over the Gilbert and Ellice islands, and between 1893 and 1900 over most of the Solomon islands. Germany had been in dispute with Spain about the Caroline islands and adjacent groups, and they were transferred to her in 1899. But meanwhile, Guam (together with the Philippines) had been ceded to the United States in 1898 as a result of the Spanish-American War. By 1900 all the island groups had been virtually taken under the ægis of the Powers, though certain administrative arrangements—as between Britain and France in the New Hebrides—were not concluded until later. By 1922 the political situation had changed in one important respect—by the elimination of Germany as a colonial Power in the Pacific, and the consequent transfer of her territories to other Powers which held them under

mandate from the League of Nations. In particular, the entry of Japan into the Caroline islands, Marshall islands and Marianas gave her a valuable basis for strategic and economic penetration southwards and eastwards.

In 1939 there were five major sovereignties in the Western Pacific controlling among them about a score of territories or dependencies (Australia, New Zealand and Great Britain being regarded as a single sovereignty from the international point of view). A variety of administrative systems was in operation (Fig. 2). Fiji and the Gilbert and Ellice islands were British Crown Colonies; the greater part of the Solomon islands formed a British Protectorate; the Kingdom of Tonga was bound to Great Britain by a Treaty of Friendship and Protection. New Caledonia was a French colony, and attached to it were the Loyalty islands; Uvea and Futuna were a protectorate. Guam and Wake island were United States possessions administered by the Navy Department; Dutch New Guinea formed part of the Outer Provinces of the Netherlands East Indies. Lord Howe island was administered as part of New South Wales; the Kermadecs were a dependency of New Zealand. Papua, in the south-east of New Guinea, and Norfolk island were territories of the Australian Commonwealth. The north-east part of New Guinea, together with New Britain and other adjacent islands, including Bougainville and Buka (in the Solomons), was a mandated territory controlled by Australia. The Caroline islands, Marshall islands and Marianas were held as a mandate by Japan, while Nauru was held under British mandate, with Australia responsible for its administration. (The British Phosphate Commissioners, appointed as representatives of Great Britain, Australia and New Zealand, controlled the phosphate industry of Nauru and of the neighbouring Ocean island in the Gilbert and Ellice Islands Colony.) Finally, the New Hebrides were administered as a condominium by Great Britain and France. Some of these administrations have been disturbed by the war, but the majority continue in operation.

Two special administrative arrangements may be noted. Elsewhere than in Fiji, the High Commissioner for the Western Pacific (an office held by the Governor of Fiji) is the authority to whom the administrations of specifically British (as distinct from Australian and New Zealand) dependencies in the Pacific are immediately responsible. Similarly the French *Commissaire général de la République française dans le Pacifique* (an office held by the Governor of New Caledonia) is the authority to whom administrations of the French

dependencies are responsible. With this office is associated that of *Commissaire de France dans les Nouvelles-Hébrides*. The two High Commissioners control administration in the New Hebrides jointly for the condominium and severally for their own nationals.

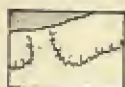
PLAN OF THIS VOLUME

The complexity of political and administrative arrangements and the diversity of island groups and peoples in the Western Pacific make it desirable in this Handbook to treat the various component parts under a combination of geographical and political divisions. This method has been followed also in the case of the Eastern Pacific (vol. II, pp. 4-5). For convenience in dealing with the bulk of material the Western Pacific groups have been divided into two sections: Fiji, Tonga, New Caledonia and the other islands in the south-eastern section, together with some others immediately linked with them politically, are described in the present volume; vol. IV deals with New Guinea and the islands adjacent to it, together with Guam, Wake island, and the islands held before the outbreak of war by Japan. The following sections deal only with the islands described in the present volume.

SOURCE LITERATURE AND MAPS

The literature of the Western Pacific islands is very extensive, but much of it is of uneven quality and range. Most useful general sources include: the *Pacific Islands Year Book* (wartime edition, 1942); *The South Seas in the Modern World*, by F. M. Keesing (1942); and (for coasts) the Admiralty *Pacific Islands Pilot*. Several British territories have issued valuable handbooks, while the series of Colonial Office reports and blue books, and the reports to the League of Nations by the mandatory Powers, are also of great value. Important periodical publications are the scientific journals *Oceania* and *Journal of the Polynesian Society*, and the series of scientific *Bulletins* published by the Bernice Pauahi Bishop Museum at Honolulu; the latter two deal primarily with the Polynesian area. Other useful topical periodicals are *L'Océanie Française* and the *Pacific Islands Monthly*. Bibliographical notes for the various island groups will be found at the ends of chapters.

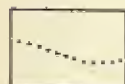
Much survey and cartographical work still remains to be done in the Western Pacific area, and the maps given in this volume therefore vary considerably in their accuracy. While in many cases Admiralty



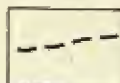
Coral reef, in general dry or awash at low water



Peak: spot height



Sunken coral reef, not awash at low water



Main ridge trend; watershed



Sand, shingle; usually partly dry at low water



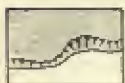
Volcanic crater (on physical maps)



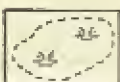
Elevated coral reef (on physical maps)



Volcanic crater (on more detailed relief maps)



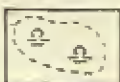
Cliffs



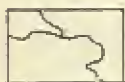
Marsh



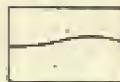
Lake (not shaded when surrounding land stippled)



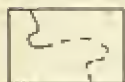
Mangroves



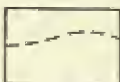
River, stream



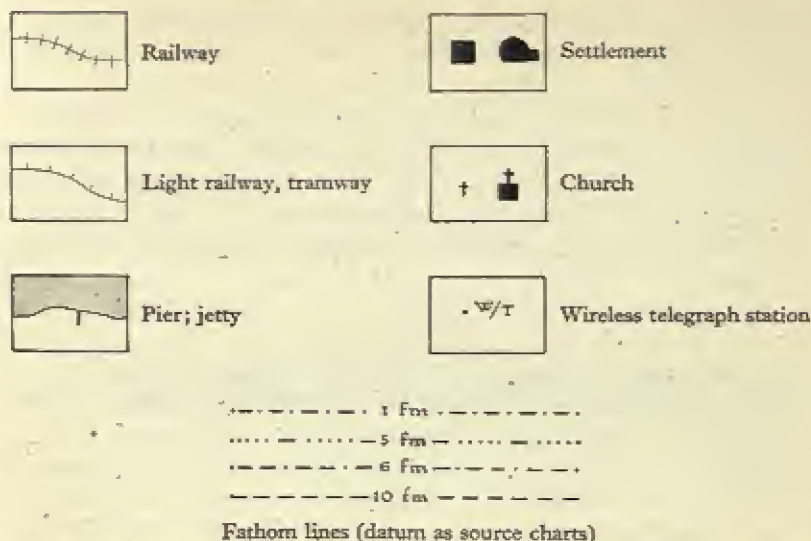
Road



Stream of intermittent flow



Track; path



Only a small proportion of coral reefs (including sunken reefs) are shown, namely those of major importance to navigation, or to a presentation of the structure of islands.

The approximate position of an anchorage is shown on some maps by an anchor symbol.

Fig. 3. Key to general symbols used on maps.

charts have been used as the basis, details, especially for the interior of islands, have often been taken from more recent local surveys by Lands Departments or other government organizations. In some cases, where no official map exists, sketch maps have been given to indicate the general character of the islands. (Details of maps and charts for the area covered by this volume are given in Appendix I.)

Latitude and longitude have been taken from Admiralty charts and *Sailing Directions*; in some cases these are only approximate, since precise observations have not been made. Reference to the *Sailing Directions* will show that some islands are reported as being several miles out of their charted position. Altitudes also cannot always be taken as exact; sources of apparently equal authority are apt to show discrepancies, and since many of the altitudes have been calculated from observations at sea they probably include the height of the vegetation. Except on a few specialized maps and diagrams, British units are used throughout the volume. Unless otherwise specified, heights are given in feet, depths in fathoms, distances on land in statute miles, and distance along the coast or from one island to

another in nautical miles. For uniformity in the treatment of maps, all scales are given in both statute miles and kilometres (or component units of these).

For the commoner physical and social features on the maps a series of conventional symbols has been used. The general key to these symbols is given in Fig. 3. When on port plans and other specialized maps different symbols are used, an individual key is provided. Mercator's projection has been used except where otherwise noted.

PLACE-NAMES

The treatment of place-names in the southern islands of the Western Pacific is complicated by several factors. In some areas the native place-names are Polynesian, in others Melanesian; while in one area, the Gilbert islands, they are Micronesian. In some areas English names and English spelling of native names are current, in others French names and French spelling of native names; while in one area, the New Hebrides, there are alternative English and French forms and spellings. Moreover, early Spanish names still in use have been spelt in several different ways in modern times.

The main principles adopted in this volume are:

1. In general, local official names, as shown on lands and survey department maps or in official documents, have been followed.
2. Exception has been made in the case of certain French official names for which conventional English forms are in common use: e.g., Noumea (Nouméa); New Caledonia (Nouvelle-Calédonie); Loyalty islands (Îles Loyautés, Archipel des Loyautés). The official French name is given in brackets at an appropriate place in the text.
3. Descriptive geographical terms are given in their English form in the text and on maps. Exceptions are made only where the geographical descriptive term is normally used as an inseparable part of the native name; and in the set of detailed maps of sub-divisions of New Caledonia, where all names are given in the full French form to assist identification from French sources.
4. Since the same native name may apply to a physical feature and to a nearby settlement, names of all physical features are given on the maps in italic lettering and names of settlements in roman lettering.
5. The system of orthography followed is in general that of the Permanent Committee on Geographical Names, the R.G.S. II system. But the inclusion is made of the glottal closure, represented

as ' (inverted comma), for which no allowance is made in the Pacific islands lists of names issued by the committee. The glottal closure, for which a special symbol is used in phonetics, is usually represented by some form of comma in scientific publications dealing with the area, and it has now been officially included in the standard alphabet of Tonga.

6. In spelling, the forms on local official maps or in recent official documents have been generally used, and supplemented from the Lists of Oceanic Names issued by the Permanent Committee on Geographical Names. In a few cases, however, the official spelling of native names has been modified in accordance with modern scientific usage, or English spelling is used instead of French spelling. In such cases of modification the official or alternative spelling is given in brackets at an appropriate place in the text.

(Further details regarding place-names are given in Appendix II.)

Chapter II

TONGA

Physical Geography: History: Growth and Distribution of Population:
The People

The Tonga group, formerly known as the Friendly islands, comprises rather more than 150 islands lying approximately between

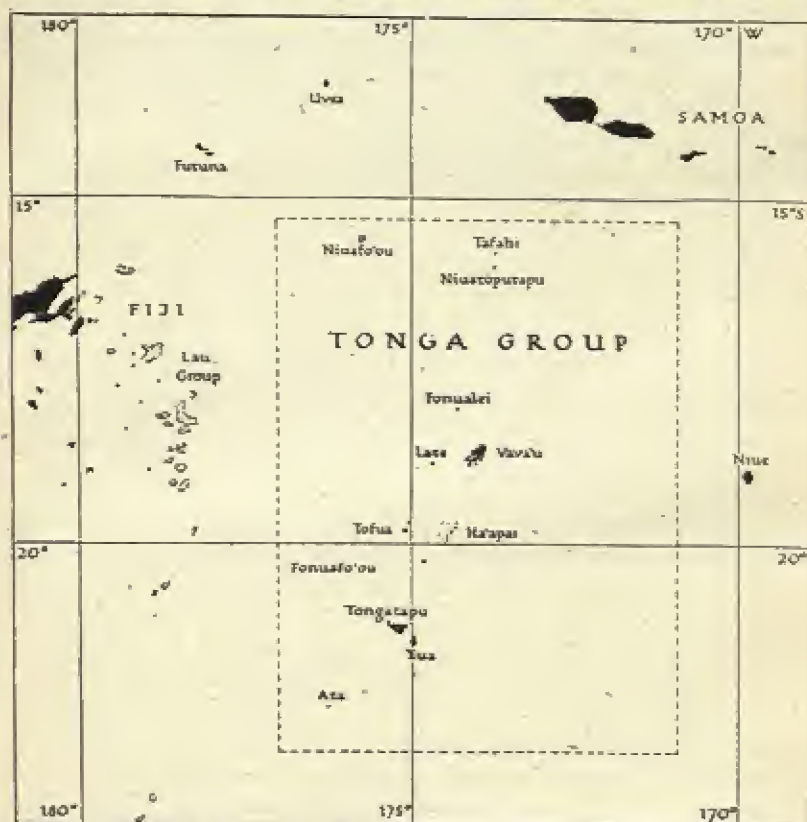


Fig. 4. The Tonga group, showing its relation to neighbouring islands and groups
Based on Admiralty chart no. 780.

lat. 18° and 23° S, and long. 173° and 176° W, to the east and south-east of Fiji and the south-west of Samoa. The islands form three main groups, Tongatapu in the south, Ha'apai in the centre and

Vava'u in the north; the division is not merely geographical, but has historical and administrative significance. There are also several outlying islands, of which the most important are Niuatoputapu, 167 miles north of Vava'u, and Niuafu'ou, 211 miles north-west of Vava'u (Fig. 4). Though the group as a whole covers such a wide expanse the total area of the islands is only 269 sq. miles, and about half of this is comprised in the Tongatapu group alone.

The Kingdom of Tonga is a limited monarchy, over which Great Britain established a protectorate by a Treaty of Friendship and Protection signed in May 1900 and ratified in February 1901. The Sovereign of Tonga is Her Majesty Queen Salote Tupou, D.B.E., who ascended the throne in 1918. The British government is represented by an Agent and Consul, who acts as adviser to the Tongan government in all matters of importance, including finance, and who derives his authority from the High Commissioner and Consul-General for the Western Pacific, at Suva, Fiji.

PHYSICAL GEOGRAPHY

STRUCTURE

The islands of the Tonga group are not of a uniform physical type. Geologically, they may be arranged in three divisions (Fig. 5):

- (i) Subaerial volcanic islands, formed above the sea by volcanic action.
- (ii) Raised marine volcanic islands, formed beneath the sea and elevated (they are usually of stratified volcanic material, but some have limestone formations as well).
- (iii) Islands formed entirely of limestone.

Subaerial Volcanic Islands

These volcanic islands form a line running approximately parallel to the long axis of the group (north-north-east and south-south-west) on the westerly side of it, though Niuafu'ou is somewhat off this line to the north-west. They appear to be part of a volcanic chain which stretches from New Zealand through the Kermadec islands to Savai'i in Samoa. Though volcanic activity seems to be extinct in some of these islands others are still active, and eruptions often occur along the chain, not only from surface vents but also from beneath the sea. Occasionally a new island has been formed by these submarine eruptions, but usually no new island appears, though the sea

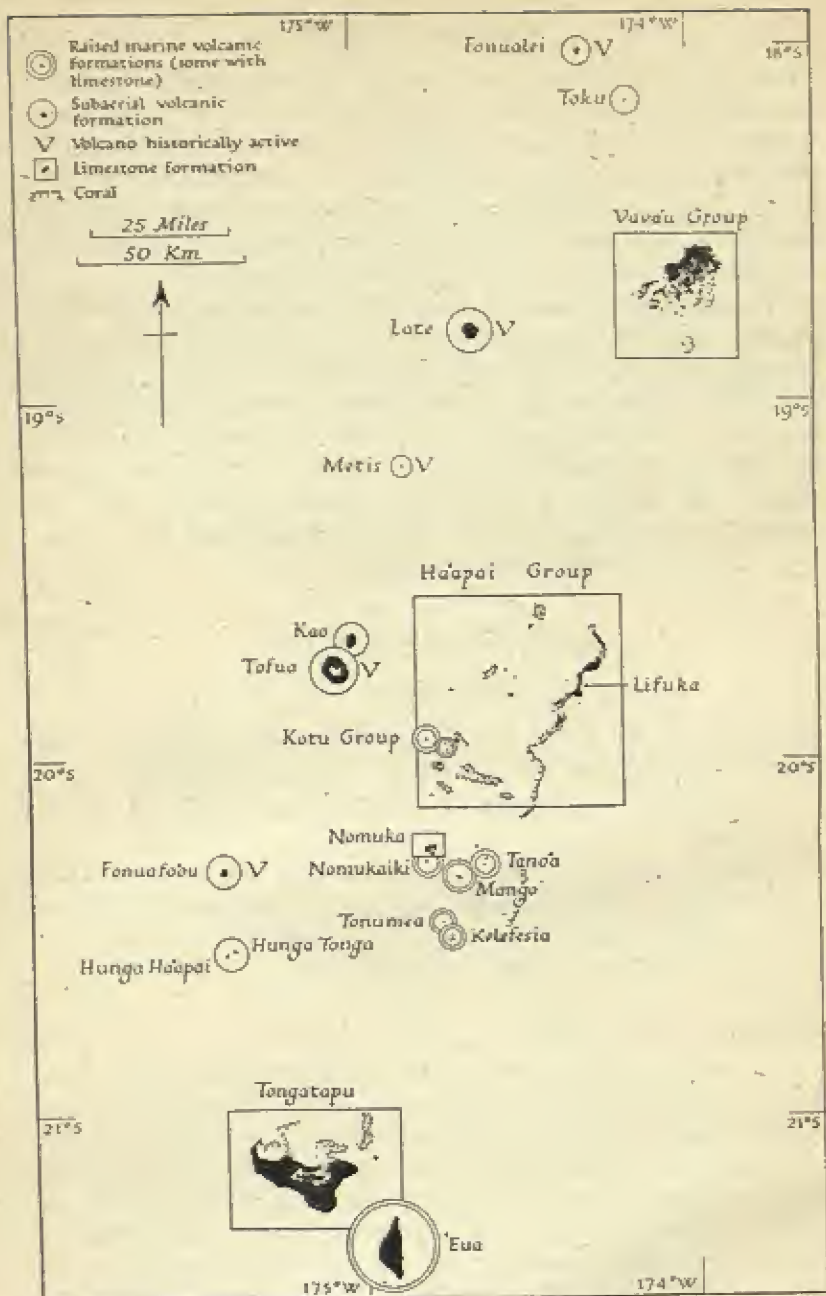


Fig. 5. Geology of islands of the Tonga group. 'Ata, Niuaotuputapu, Tafahi and Niuafo'ou are omitted on account of their distance from the main islands

The map shows the volcanic chain on the west and the predominance of limestone formations on the east. Based on J. J. Lister, 'Notes on the Geology of the Tonga Islands', *Journal of the Geological Society of London*, vol. XLVII, p. 590 (London, 1891).

is apt to be covered with pumice and ash which float on to the beaches of islands in the vicinity.

Islands in which volcanic activity may be regarded as extinct comprise 'Ata, Hunga Tonga and Hunga Ha'apai, Kao, Niuatoputapu and Tafahi. 'Ata (Pylstaart), lying south-west of Tongatapu, is the most southerly island of the Tonga group; it has two peaks, the higher having an elevation of 1,165 ft. Hunga Tonga and Hunga Ha'apai, to the north of the west end of Tongatapu, are two small islands which are clearly fragments of an old volcanic cone. They stand out of the sea about $1\frac{1}{2}$ miles apart, Hunga Tonga reaching a height of about 490 ft. and Hunga Ha'apai about 400 ft. Each island has a high vertical face on the inward side, with layers of black hard rock alternating with softer layers, the slope being outwards and downwards away from the original centre of the crater. Kao, lying on the western side of the Tonga group, presents a singularly perfect conical outline from all points of view. The peak reaches a height of 3,380 ft., and is known as Tokonako. This volcano has not been active within the whole period of any Tongan tradition, though it is close to Tofua, which erupts. Niuatoputapu and Tafahi lie to the north of Vava'u, halfway between it and Samoa. The former, largely flat but with a hill 350 ft. high in the centre, would appear to have been greatly denuded; the latter, reaching an elevation of about 2,000 ft., is cone-shaped and very rocky, rising steeply from the sea.

Islands which show signs of volcanic activity, sometimes of great violence, comprise Fonuafo'ou (Falcon island), Tofua, Late, Fonualei and Niuafo'ou; with them may be included Metis shoal, which for a time has been an island, of the same character as Fonuafo'ou. (A description of these islands is given in the section on recent volcanic activity, pp. 23-30.)

Raised Marine Volcanic Islands

The islands formed from submarine volcanic material comprise several in the Ha'apai group and 'Eua, a little to the south-east of Tongatapu. The Nomuka group, which forms the southern division of the Ha'apai group, consists of a number of small islands which are the emerged highest points of an extensive submarine plateau, with depths of less than 50 fathoms over a large area of it. Nomuka island itself is of limestone formation, but other islands in the vicinity of it, such as Mango, Tonumea, Tonua and Nomukaiki, are formed of volcanic tuffs, largely stratified as a result of submarine action.

The island of Mango is composed for the most part of layers of volcanic tuffs, which vary much in character. At the eastern and western ends of the island, which is about 2 miles long, there are rounded hills attaining a height of about 150 ft. above sea level. The summit of the eastern hill is formed of thick and approximately horizontal layers of fine white material which is largely calcareous but contains also a fine volcanic residue. The western hill is composed of layers of a coarse conglomerate, dipping slightly towards the west-south-west, and consisting of rounded fragments of lava embedded in a calcareous matrix; fragments of coral, some of them 6 in. in diameter, are mixed with the volcanic fragments. Between the hills, layers of the two kinds of rock are found in alternation. Projecting to the south of the west end of the island is a small peninsula, formed of a mass of breccia traversed in various directions by cracks, but presenting no regular stratification. The fragments are embedded in a calcareous matrix and vary greatly in size. On the surface are large boulders, some of coral and others of volcanic rock, evidently left isolated by removal of the finer material around them; and in a cliff which surrounds this part of the island fragments of coral are thickly scattered among the volcanic constituents. But though Mangō is surrounded by a broad fringing reef, no raised coral rock has been found upon it.

The island appears to have been formed originally as a submarine bank, probably due to volcanic action, and on this corals grew. On a return of volcanic activity violent explosions broke up the coral reef and the fragments of it were mixed with the volcanic materials to form the breccias of which the island is now composed. The southern peninsula, where the constituents are largest and mixed without stratification, was probably nearest to the point of eruption. The island was subsequently elevated to its present height, probably too rapidly to allow of the growth of coral reefs to any extent in the process, and weathering reduced the hills to their present rounded outline.

A similar reconstruction would account for the formation of the other tuff islands of the Nomuka group, as also for Kotu and Matuku, a little further to the north. In some cases, however, as for instance Nomukaiki, where the material consists primarily of alternating fine and coarse beds of brown and grey ashes, with molluscan remains but no coral, the submarine layers would seem to have been formed under quieter conditions than in the case of Mango.

The structure of 'Eua, which has received more study than that

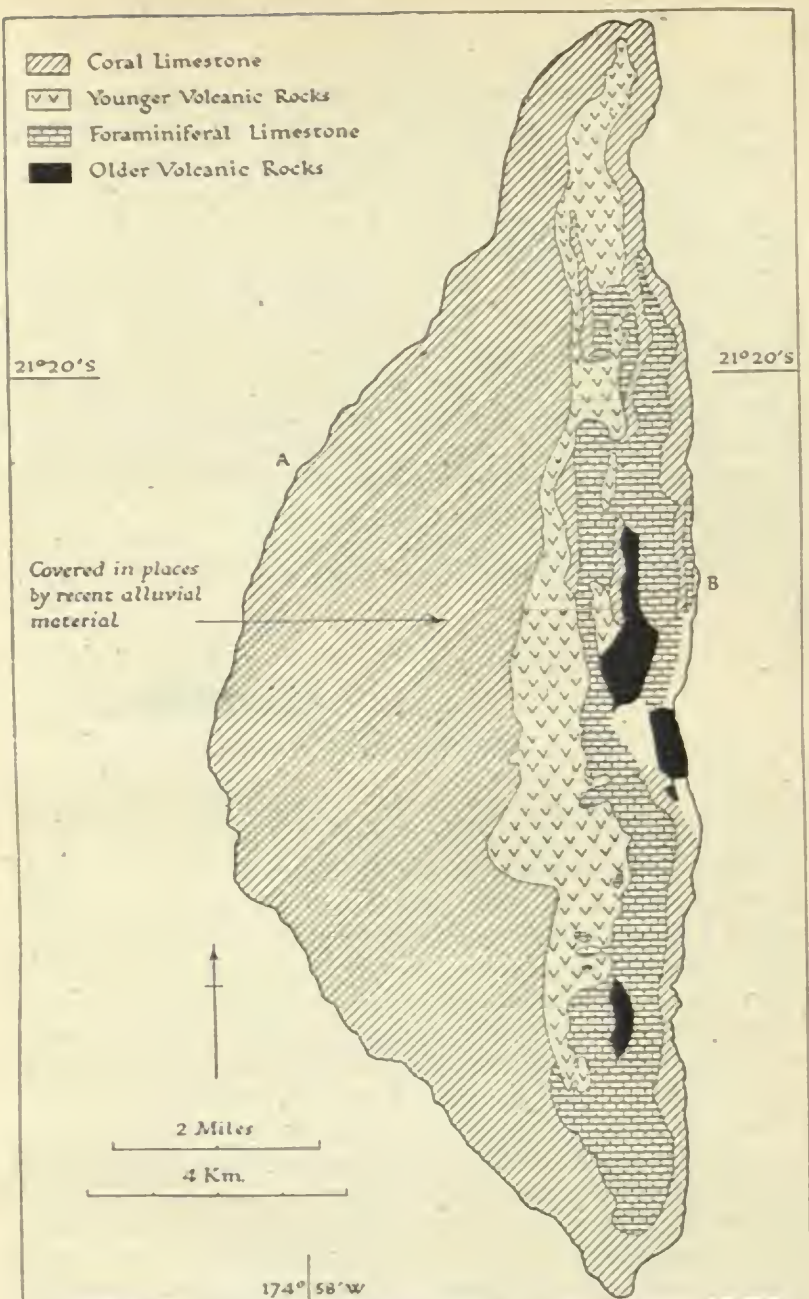


Fig. 6. Geology of 'Eua, Tonga

The blank spaces on the map represent areas about which no information is available. A and B indicate the points between which the section (Fig. 7) is taken. Based on J. E. Hoffmeister, *Bernice P. Bishop Museum Bulletin*, no. 96, Fig. 3 (Honolulu, 1932).

of other islands of the Tonga group, conforms to the same general category of islands composed of a nucleus of bedded volcanic material on which have been deposited beds of limestone. But it also has lava flows and intrusive dykes, and its geological history would appear to be somewhat more complicated than that of the other islands in the vicinity (Figs. 6, 7).

The western part of the island, including the western ridge and the greater part of the central valley, is composed of limestone, while the eastern part of the island comprises both limestone and volcanic material. Along the seaward side of the summit of the eastern ridge is a curious limestone wall, varying from about 3 to 30 ft. high and apparently a product of erosion. From the base of this wall the descent to the sea is made by sheer limestone cliffs interrupted by a series of well defined terraces, six in all. These terraces, which are broken at intervals, have an average altitude from sea level of 100, 200, 340, 400, 550 and 760 ft., and differ considerably in breadth,

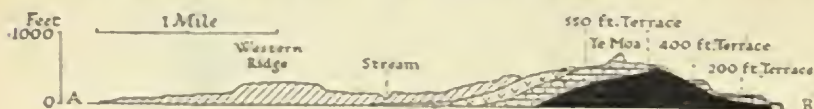


Fig. 7. 'Eua, Tonga: geological section.

For key see Fig. 6. The symbols are not intended to give any indication of dip of the strata. Based on J. E. Hoffmeister, *Bernice P. Bishop Museum Bulletin*, no. 96, Fig. 4, section B-B' (Honolulu, 1932).

the 400 ft. terrace extending around the tip of the island as a broad flat, while most of the others are narrow. On parts of the ridge summit, however, and also in places along the eastern terraces and the beach below, the limestone has been cut away, exposing the underlying volcanic rocks. The whole western side of the ridge including the upper part of the slope to the central valley is composed of a soft red volcanic tuff, with conical or flat-topped hills produced by erosion. But in places here as on the northern part of the ridge summit, much of the volcanic material overlies limestone, as is shown by sink-like depressions which in a few cases go right through the surface material and expose the limestone beneath.

This and other evidence reveals two distinct ages of volcanic rocks on the island, the tuffs of the younger presenting less angular and finer grained fragments, though in general composition similar to the older rocks. The limestones too are of two types, an older consisting chiefly of foraminifera with some molluscs and echinoids, and a younger consisting primarily of typical corals. In general the

foraminiferal limestones occur only along the upper eastern side of the island, while the coral reef limestones make up the western side of the island and also the lower seaward terraces on the eastern side.

The geological history of the island may be reconstructed in simplified form as follows. Volcanic eruptions built up a mound, the material of which was probably re-worked by wave action and carried by currents to form a submarine platform. During a subsequent quiet period lime-secreting organisms, chiefly foraminifera, deposited beds of limestone 200 ft. or more in thickness over the volcanic base. After renewed volcanic activity intermittent uplift occurred, during the pauses of which the terraces were cut by marine action, chiefly on the windward eastern side. And during the entire progress of the uplift corals and other shell-bearing organisms were depositing beds of limestone over the island in the form of coral reef veneers on the eastern side and thicker reefs on the western side. Later elevation tilted the island so that the eastern and southern sides now stand higher than the western and northern sides.

Limestone Islands

The islands formed entirely of limestone comprise: Tongatapu and Vava'u; the smaller islands around Vava'u; nearly all the islands of the northern Ha'apai group, including Ha'ano, Foa and Lifuka; and Nomuka in the southern portion of the Ha'apai group. The material of all of them is of coral origin, and it would seem that they have all been formed by the elevation of atolls or barrier reefs, though the elevation has been unequal at different points of the area.

Tongatapu, the largest island of the whole group, is some 22 miles in greatest length, and of irregular crescentic shape, with the convex side to the south. The coral limestone of which it is composed reaches the surface in many places in large flat patches, though elsewhere it is covered with a layer of reddish brown clay. Extensive caverns and subterranean galleries have been hollowed out in the limestone by rain water which has percolated through this porous rock. Considerable tracts along the northern shore of the island are low and not above the reach of the highest tides, but the level gradually rises towards the convex southern side, the highest part being at the south-east opposite 'Eua, where there is a low cliff of coral rock. To the north of the island there is a shallow area of considerable extent, with coral reefs on many parts of the seaward margin; several islets, some of sand and others of coral rock elevated to about 15 ft. above

the surface, are dotted along the reefs. Opposite the middle of the northern shore of Tongatapu there is a large basin (forming the harbour of Nuku'alofa), while the interior of the island is partly occupied by an irregular and shallow lagoon communicating with the sea on the north. The central part of the Tongatapu area, represented by the lagoon and the basin, is at a lower level than the circumference, represented by the coral reefs and islets to the north and the higher land to the south and east. This gives the basis for Darwin's view that Tongatapu represents an upraised atoll, though of somewhat imperfect form.

Nomuka, in the southern part of the Ha'apai group, is a small triangular island of coral limestone, with a large shallow lagoon occupying a great part of the interior (Fig. 27). The land border is broad on the west and north-west of the lagoon, but elsewhere is narrow. A ridge on the western side attains a height of over 160 ft., but on the east the land is much lower, varying from 15 to about 100 ft. above the sea, and on the south-west it is often hardly higher than the top of the beach. The depth of the sea for some distance around is less than 20 fathoms. Nomuka is evidently an atoll which has been formed in shallow water by successive elevations, the ring having been completed only in the last stages.

The larger islands of the Ha'apai group lie in a line extending from Ha'ano in the north to Alefa in the south and constitute the elevated parts of a long reef which, after extending in a south-westerly direction for some 30 miles, sweeps round in a curve to the west and north-west, and is finally lost among the reefs and islands of the Kotu group. This long reef may be regarded as a barrier reef or imperfect atoll which has undergone some elevation of an unequal kind.

The island of Lifuka, politically the centre of the group, may be taken as a typical example of the structure. It is about $\frac{3}{4}$ mile in breadth on the average and some 5 miles long. From the beach on the western side there is a very gradual slope up towards the eastern side of the island, which is about 20 ft. above high water. Near the eastern side there is a rather rapid fall, terminating in a little cliff some 10 ft. high, extending along the whole eastern shore. This eastern shore cliff, common to many of the Tonga islands, is known locally as the *liku*. The rock of which the cliff is made consists of masses of coral of various sizes cemented together into a conglomerate, and the cliff base is much excavated by wave action. The height of the other islands of the group varies, though not to any



Plate 1. North coast of Vava'u, Tonga

The cliffed coast (*liku*) is typical of the north of the island. The trees are pandanus.



Plate 2. Vaipu'uua inlet, Vava'u

The view of this narrow, deep arm of the sea, which stretches northwards and westwards, is taken from Muitalau. To the east of the inlet are groves of coconut palms.



Plate 3. Neiafu harbour, Vava'u

The landlocked harbour gives excellent shelter. The photograph was taken in 1931, and there has been some development of the town since then.



Plate 4. A road in Tonga

Most of the motor roads are surfaced with coral limestone. There are also many minor roads, mostly with earth surface.

great extent, those to the north and west having apparently undergone rather greater elevation than those to the south.

Vava'u and the small islands around it, while belonging to the coral limestone group, are remarkable for their elevation as compared with the other limestone islands of Tonga. Vava'u itself, with much land over 100 ft. in height on the south and south-west, rises to the north and north-east to a maximum height of 670 ft., the coastline there being bordered by limestone cliffs, *liku* (Plate 1), 300-500 ft. high. While the northern coast is fairly even, that on the south and south-west is characterized by long promontories stretching out from the main mass of the island, and separated by narrow, deep arms of the sea (Fig. 28). Off this coast are small islands, in some cases continuing the lines of the promontories. These off-lying islands and projecting points of the main island are flat-topped in profile (Plate 5), and the majority of them stand at one of three levels of elevation above the sea—approximately at 140 ft., 260-350 ft., or 420-520 ft. Corresponding with the tops of the lower islands there are terraces on the sides of the intermediate and higher land, leading to the description of the islands and promontories as having one, two or three storeys. The differences in the levels may be in part explained by an unequal force of elevation at the various points of the area. In some cases the summits of the islands, though level in profile, show well-marked depressions. The most striking is the small island of A'a, which has an outer rim rising steeply from the sea to a height of from 85 to 95 ft., while the interior is a flat depression only some 35 ft. above sea level. It would thus appear that the islet was formerly an atoll with a lagoon some 10 fathoms deep occupying the centre when the margin stood at sea level. The margin now consists mainly of rough masses of limestone rock, while the interior is of brown earth.

The shape of the Vava'u group as a whole, penetrated by long, narrow deep inlets of the sea, suggests that it was formed on a much denuded basis, probably of volcanic nature, the surface of which was deeply scored by valleys previous to a period of subsidence. During this period the deposits which formed the limestone rock may have begun to be laid down, and continued during subsequent elevation.

Recent Volcanic Activity

Volcanic activity in the group has at times been of a spectacular nature. Perhaps the best known instance is that of Fonuafo'ou

(Falcon island), a recently formed volcanic mound which has attracted much attention through its alternate appearance and disappearance.

In 1867 H.M.S. *Falcon* reported a shoal in about lat. $20^{\circ} 20' S$, long. $175^{\circ} 20' W$, about 30 miles west of Nomuka. In 1877 smoke was reported by H.M.S. *Sappho* to be rising from the sea at this



In 1889 a thorough examination of it was made by H.M. surveying-ship *Egeria*, Commander Oldham, and it was then 1.1 miles long and 0.9 mile wide (Figs. 8, 10). The southern part was faced by cliffs, the summit of which was 153 ft. above the sea, and from the top of these a gradual slope led down to a stretch of flat land crossed by curved cinder ridges from 3 to 12 ft. high, apparently formed by spring tides and strong winds. A little steam issuing from cracks in the cliffs was the sole sign of activity, but a pool of sea water which had filtered through the ash had temperatures from 91° F. to 113° F. and in a hole dug in the flat the temperature was 128° F. The whole island was formed of ash and cinders, with a few volcanic bombs and blocks especially on the verge of the cliffs. This loose material was being rapidly removed by wave action, under the influence of the almost constant south-easterly winds. It was considered that the original summit was some 200-300 yd. to the south of the cliffs, that the shallow bank stretching to the south represented the former extension of the island, and that the flat land to the north was due in part to redistribution under the lee of the island of material removed from the southern face. In 1890 the island was being rapidly reduced by the sea.

In December 1894 the island was about $1\frac{1}{4}$ miles in diameter and about 50 ft. high at the southern end; in the centre was a lake about 4 or 5 ft. deep, of clear fresh water with a strong mineral chloride flavour. The land surface was composed of red and black scoriae, and while the sea had depths of 40 fathoms close to the island, the water was discoloured for 3 or 4 miles away owing to the detritus. In one part the surface of the island was so hot that it blistered the bare feet of visitors.

In 1898 the island was reported as being only a reef, barely awash. In April 1900 it had re-emerged slightly as a black hump protruding some 9 ft. above the waves, but by 1913 it was reported to have disappeared altogether. In November 1921, when the site was visited by H.M.S. *Veronica*, there was discoloured water, with a very heavy swell and a continuous break at the south-west corner of the area. The break was caused by a rock about 15 yd. in diameter and of a mottled greenish colour, and the bottom was plainly visible for some distance around.

On 4 October 1927, however, the island was reported to be erupting again, and when observed three days later it was 1,730 yd. long north and south, 1,430 yd. broad east and west, and 305 ft. high. Every twenty minutes the volcano erupted for one minute, and the

steam and other material rose to a height of over 4,000 ft., being occasionally visible from Tongatapu, 60 miles away. In May 1928 the island was visited by a party, including the Premier of Tonga, who annexed it for the government. It was then roughly circular, about 2 miles across and 365 ft. high in greatest elevation, on the west wall of the crater (Fig. 9). The crater was near the south-east (windward) side of the island, nearly a mile wide, with sides con-

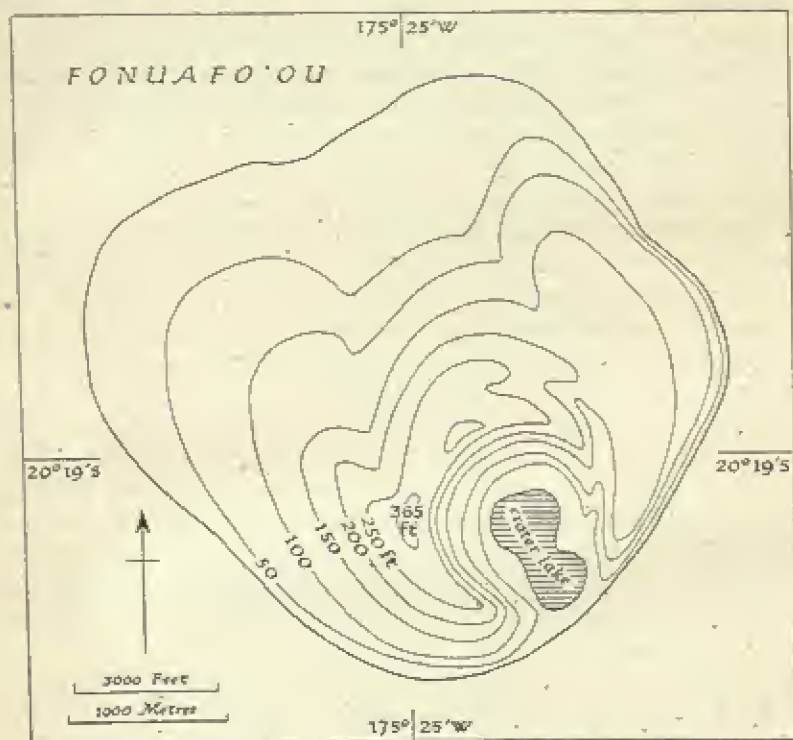


Fig. 9. Fonuafo'ou (Falcon island), Tonga, in 1928

Based on J. E. Hoffmeister, H. S. Ladd and H. L. Alling, 'Falcon island', *American Journal of Science*, 5th series, vol. XVIII, p. 462 (New Haven, 1929).

stantly steaming and showing deposits of sulphur of a yellow, orange or white colour. There were actually parts of two craters, a younger one with steep walls lying within an older one. The south-eastern wall of the crater was very low, and storm waves had gained access over a barrier of re-worked scoria, forming a crater lake, part of which was boiling vigorously. The water was acid, with much free sulphur. Round the lake were flats of ash, with sulphur deposits and

many steam vents. The island consisted chiefly of unconsolidated volcanic ash, pumice and scoria, but numerous small volcanic bombs and blocks of solid lava were scattered over the crater wall, particularly on the windward side. There were no lava flows. Already the sea had cut steep cliffs 100 ft. or so high along the windward side, and some of the material was being shifted to leeward and re-deposited, as had occurred forty years before. The cliffs were being undercut by the waves, and huge sections slipped from time to time

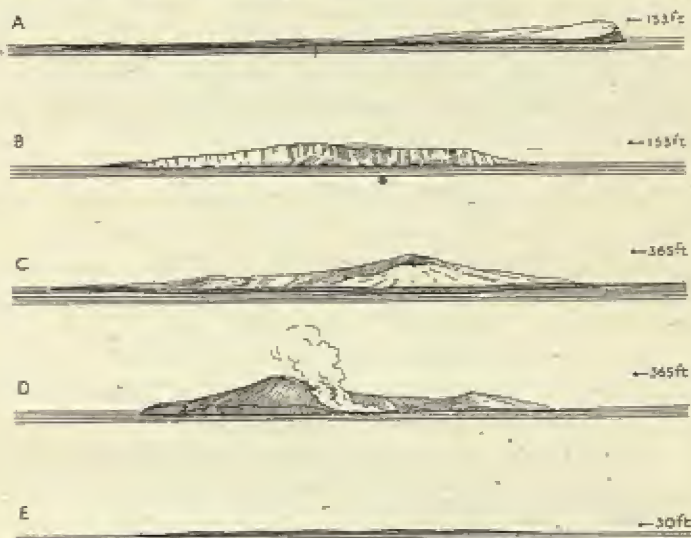


Fig. 10. Fonuafu'ou (Falcon island), Tonga: profiles during half a century.

A (from west) and B (from south), in 1889; C (from north-west) and D (from south), in 1928; E (direction not known), in 1940. Based on: (1) J. J. Lister, 'A Visit to the Newly Emerged Falcon Island, Tonga Group, South Pacific', *Proceedings of the Royal Geographical Society*, new series, vol. XII, p. 160 (London, 1890)—for A and B; (2) J. E. Hoffmeister and H. S. Ladd, 'Falcon, The Pacific's Newest Island', *National Geographic Magazine*, vol. LIV, pp. 762, 763 (Washington, D.C., 1928)—for C and D; (3) F. R. Charlton, 'Fonuafu'ou or Falcon Island', *Geographical Journal*, vol. xcvi, p. 33 (London, 1941)—for E.

into the sea. The leeward (north-west) side of the island was not cliffed, but there was a steep bank of coarse black scoria on which the surf broke. Apart from the action of the sea, the island was undergoing erosion from rain water, which had scored deep gullies down the slopes.

Fonuafu'ou continued to erupt at intervals for some years, and for a time its dimensions seemed to have increased. In October 1928 it was reported to be about 405 ft. high, and in October 1930 to be

about 475 ft. high. In 1936 its maximum height was only about 200 ft. Volcanic eruptions came at intervals of about every 15 minutes from a submarine vent off the south-east corner, but by this time a second period of reduction seems to have begun. In 1938 the volcanic activity had apparently subsided, and the island was about $1\frac{1}{2}$ miles long, rather flat, and only about 30 ft. high. In November 1940 its maximum height was estimated as 20-30 ft. (Fig. 10). It had steep scoria beaches swept by a heavy surf, and there was no sign of volcanic activity, though the scoria was unpleasantly hot inland. The surface consisted of a series of low parallel ridges with wide shallow depressions between, and the island had a bare desolate appearance. There was no vegetation other than one small coconut palm about 3 ft. high—possibly germinated from a nut planted in 1928.

To the north of Fonuafo'ou is Tofua, rising to a height of about 1,600 ft., and with an area of about 21 sq. miles. Over 3 sq. miles is occupied by a crater lake known as Lofia. The island is in a state of intermittent volcanic activity, the vent being on the northern side, about 200 ft. above sea level. In September 1900, when the volcano was in eruption, the dull glare from the crater was illuminated every few minutes by a burst of flame, and masses of red-hot rock were projected into the air with deep reverberations.

To the north-east of Tofua lies Metis shoal, which appears to have emerged once from the sea in the same manner as Fonuafo'ou. An islet 29 ft. high was reported there by the *Metis* in 1875, and when passed by H.M.S. *Sappho* in 1878 it was about 200 yd. long and 110 ft. high, volcanic action having added to its size in the interim. Quantities of white smoke were being emitted from it, and it was apparently covered with sulphur. It was said to have been still in activity in 1886, and in 1890 its height was given as 151 ft. But by 1898 it had a depth of 2 fathoms over it.

Further again to the north-east is Late, which rises to a height of about 1,700 ft. and has two craters. Late is a volcano which may perhaps be regarded as dormant, since it has not erupted since 1854. When visited by H.M.S. *Esk* in 1866 and by H.M.S. *Penguin* in 1898, vapour was seen issuing from a crater. Fonualei, about 40 miles north-west of Vava'u, and the most northerly island of the Tonga group proper, is also a volcano which remains dormant for many years at a time, but breaks out at times into violent eruption. In August 1847 an eruption destroyed part of the island (which has since been described as a 'hopeless wreck') and threw out ash in

such large quantity that gardens in Vava'u were spoiled and vessels passing 500 miles or so to the north-east received wind-borne material. In the latter part of 1937 Fonualei was again active, and on 8 July 1938 it was in violent eruption. In June 1939 smoke and steam were still being emitted from the summit, and steam was also coming from the south-eastern side of the island; this side was entirely covered in recent lava. Spouts of water due to submarine volcanic disturbances were observed in the sea about 1 mile south-east of the island.

Niuafo'ou, lying 211 miles north-west of Vava'u, is a ring-shaped island with a large lake occupying a central crater sink. The total area of the island is about 19 sq. miles, of which the lake and its subsidiaries comprise about 6 sq. miles (Figs. 31, 32). The island is subject to intermittent volcanic activity, which has proved dangerous to human settlement. Eruptions within historic times have taken place about 1814, and in 1853, 1867, 1886, 1912, 1929, 1935 and 1943. The eruptions of 1814 and 1886 were steam-blast phenomena; they piled up sand islets and peninsulas in the lake, strewn the island with dust and sand, and broke down crops with mud. In 1886, after an earthquake on 31 August, an explosive eruption ascended 3,000 ft. from the lake, violent lightning storms developed, and big steam-blast vents opened to pile up sand hills which ultimately were from 200 to 400 ft. high. There were three days and nights of semi-darkness, but the outbreak as a whole lasted 18 days. On the leeward side deposits on the ring ridge were 20 ft. deep, and even on the settlements ash lay $2\frac{1}{2}$ ft. deep. There seems to have been no direct loss of life.

The other outbreaks were lava eruptions, and took place not within the crater ring but along cracks trending chiefly north and south at the base of the ring ridge on the west side of the island. In 1853 the village of Ahau was destroyed and a number of people lost their lives; in 1929 the village of Futu was also destroyed, though no lives were lost since the people were warned in time and fled to the hills. In all these outbreaks lava flows have moved down the western slopes, covering much good agricultural land, and in many cases reaching the sea (Fig. 31). The lava is a felspar basalt similar to those of Hawaii, but with olivine less conspicuous. In the 1929 eruption, which was typical, the old cracks of the earlier eruptions suddenly extended northwards, and fiery slag shot up from a line of small craters. Fountains of lava shot up 20-50 ft., spraying out in glassy needles, spattering in lumps, and building up long

ridges along straight chasms; torrents flowed out in solid fields, and among other phenomena many coconut palms were moulded by lava so as to leave groves of stone trees 5-13 ft. high. The eruption began on 25 July and lasted little more than a day, but in that time a great deal of damage was done. A small eruption also took place on the south side of the island in 1935. In 1943 there were more severe outbreaks (the last being on 26 September) which rendered much of the island one continuous lava field. There was no loss of life, but much destruction of crops.

RELIEF

In general there is a strong contrast between the western volcanic islands of Tonga, the larger of which are mountainous and rugged with steep sides, and the eastern stratified tuff islands and limestone islands, which are on the whole low and comparatively flat. In altitude Tofua and Late, two volcanic cones of the west, are well over 1,000 ft. high and Kao reaches a height of 3,380 ft. In the east, on the other hand, while 'Eua has an altitude of about 1,000 ft., Tongatapu is less than 300 ft. high, and nearly all small islands round it are less than 100 ft. high. All the Ha'apai group with the exception of Nomuka have an altitude of less than 150 ft. and most less than 100 ft.; and, though Vava'u reaches a height of 670 ft., practically all the islands around it have heights of less than 300 ft. In the group as a whole, in fact, few hills are regarded by the people as high enough to deserve names.

Except on the volcanic islands, and on Vava'u and 'Eua, valleys are few and shallow. Owing primarily to the porous nature of the soil and underlying rock, streams are practically non-existent. There is one permanent stream on Niuatoputapu and there are several on 'Eua, flowing in V-shaped ravines at times as much as 100 ft. deep. On Tongatapu and other islands rain water finds its way to the sea through underground channels cut in the limestone, sometimes emerging in springs on the shore.

Freshwater lakes of some size occur in the old craters of some of the volcanic islands, as Tofua and Niuafu'ou, and there is also a small and fairly shallow lake in the south-west of Vava'u.

Further physical detail is given in the description of the individual islands in Chapter III.



Plate 5. North-east coast of Vava'u

This view shows the characteristically flat-topped headlands and steep cliffs, with occasional white patches caused by landslips showing through the vegetation.



Plate 6. Blowholes, Tongatapu

The spray shoots up as waves striking the limestone wave bench rush into clefts and expel mingled air and water with great force through narrow apertures.



Plate 7. Pangaimotu island, Vava'u

The island is thickly wooded with coconut palms and other cultivated trees and plants.



Plate 8. Angaha, Niusfo'ou

In the centre of the picture is the landing place, with its copra chute (Fig. 33). The wooded slopes behind the settlement rise to the crater rim. The photograph was taken before the eruption of 1943.

COASTS

Coastlines in the Tonga group are of a varied and complicated character, so that a detailed description of them is best given for each island in turn (Chapter III). But in a general schematic way, if the group be thought of as arranged roughly in a ring, there is a marked difference between the outer and inner coastlines. On the outer edge of the ring (represented by the north side of Vava'u, the east side of Ha'apai, the south-east and south sides of Tongatapu, and by the more isolated islands of Niuafo'ou, Niuatoputapu, 'Eua; 'Ata, Tofua, Kao and Late) the coastline tends to be rugged and cliff-fringed, often high, without major indentations. On the inner edge of the ring and within it (as on the south side of Vava'u, the west side of Ha'apai, the north side of Tongatapu, and around the Nomuka, Kotu and other groups of small islands lying between) the coastline is usually low, much indented, and complicated by an elaborate reef system. On the outer edge of the ring navigation is simple, but anchorage and landing are difficult; on the inside of the ring navigation is not easy, but anchorage, shelter and landing are available.

A feature of the southern coasts of the islands is the almost continuous heavy surf resulting from the swell raised by the south-westerly gales in high southern latitudes. Earthquakes are common, but not severe as a rule, though damage has been caused on the low islands of Ha'apai, such as Lifuka and Uiha, by seismic sea waves.

Anchorage is given later for each island in turn. But for the group as a whole the three anchorages in most general use are those serving the ports of Nuku'alofa (Tongatapu), Lifuka (Ha'apai) and Neiafu (Vava'u), the first being the principal port of Tonga. Anchorage in Nuku'alofa harbour is in moderate depths, and is fairly clear of dangers, but approach must be made through somewhat complicated channels through extensive coral reefs. Anchorage at Lifuka is of the same type, though more limited and exposed to westerly winds; Neiafu harbour, lying landlocked between the north-east coast of Pangaimotu and south-west coast of 'Uta Vava'u, is easily the best in the group from the point of view of approaches and shelter, but is inconvenient because of its great depth and indifferent holding ground. The Vava'u group, with its deeply indented coastline, offers a number of other useful anchorages. Elsewhere anchorage is apt to be poor.

Port facilities in the group as a whole are not highly developed

and except at Nuku'alofa and Neiafu landing must be made from boats, either at small piers or jetties or on to the reef. Roads lead to the interior of the islands from any of the landings ordinarily used, but except on Tongatapu and in the vicinity of Neiafu and Pangai they are often not fit for vehicular traffic.

CLIMATE

The Tonga group, lying well to the south of the equator, has a comparatively pleasant climate for the tropics. The heat is less than in Fiji and Samoa, and cool nights are generally experienced in Tongatapu and 'Eua. Humidity during the middle of the year, however, is apt to be high, especially in the northern islands, and is trying to Europeans.

The prevailing winds are the trades, which blow from May to November, mainly from the east-south-east, though becoming south-easterly in July. From December to April the winds are more variable, but are commonly from the east. In January they may blow from the north-east, but in February, March and April they are sometimes from the west or north-west, with violent squalls accompanied by showers.

Hurricanes are liable to occur from November to March, and one has even been known as late as May. These begin in the north-west, shift to the northward and eastward and end in the south-east. They usually last for the greater part of a day and a night. In the south of the group, as at Tongatapu, they are not often experienced, but they are more frequent in the northern islands, where they are very destructive to plantations and buildings, and necessitate relief being sent to the people by the government. Loss of life is rare, but the damage is especially severe to the coconut palms, which may be affected for several years, whereas bananas and other short-term crops can be quickly replanted. The hurricane of December 1930 destroyed almost every house on Niuatoputapu. The most disastrous hurricanes of recent years have been at Niuafu'ou in April 1909; at Vava'u and Ha'apai in January 1912 and February 1913; at Niuafu'ou and Niuatoputapu in December 1930; at Niuafu'ou in February 1931; and at Vava'u and Niuafu'ou in March 1932.

Temperature is on the whole equable. In any month the absolute maximum hardly ever rises above 90° F. or falls below 80° F. and the absolute minimum above 70° F. or below 50° F. For most of the year the mean temperature is between 70° F. and 80° F. The hottest

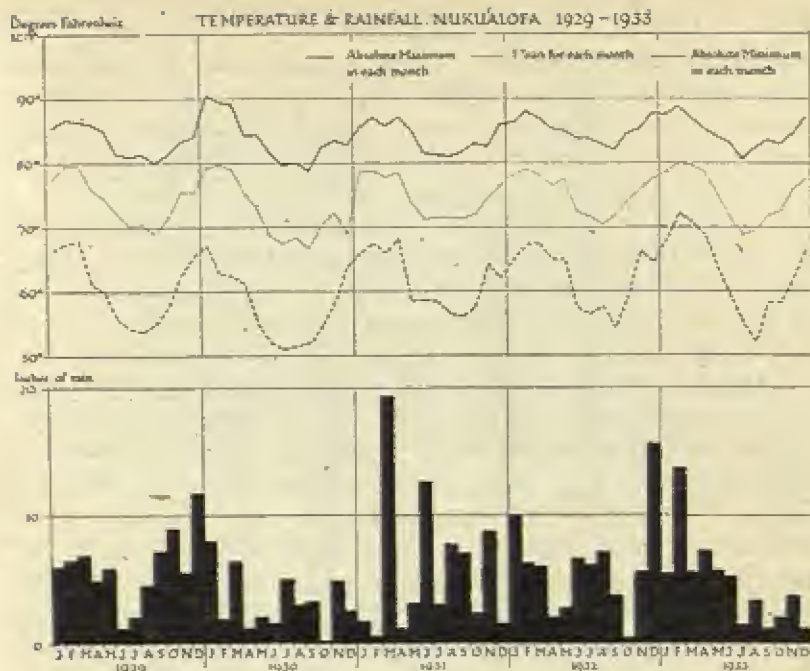


Fig. 11. Monthly temperature and rainfall, Nuku'alofa, Tonga, 1929-33

This diagram may be compared with a similar one for Apia, Samoa (vol. 11, p. 389), and with Fig. 14, giving other sample years for Nuku'alofa. Based on data from *Tonga Government Gazette* (Nuku'alofa, 1929-33).

ANNUAL RAINFALL, TONGATAPU. 1917 - 1940

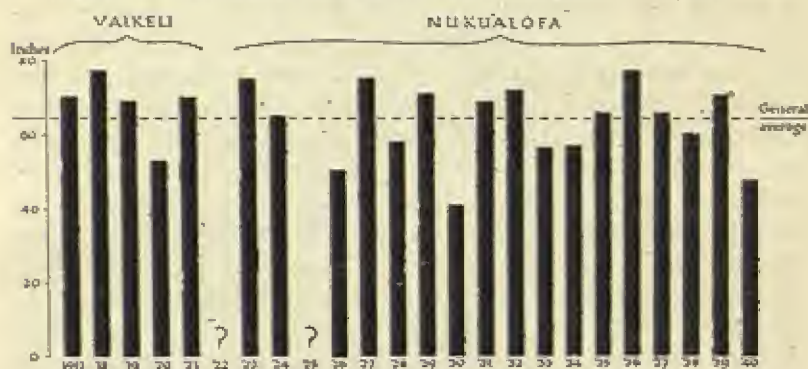


Fig. 12. Annual rainfall, Tongatapu, 1917-40

Based on: (1) *Agricultural Department Report* for 1917-21, 1939-40 (Nuku'alofa); (2) *Colonial Office Annual Report* for 1923-31 (London); (3) *Tonga Government Gazette* (Nuku'alofa, 1932-7); (4) *Premier's Annual Report* for 1938 (Nuku'alofa).

months are usually January, February and March, and the coolest July, August and September (Fig. 11). The northern islands naturally tend to be hotter than the southern islands. While the mean annual temperature in Nuku'alofa is about 75° F. that in Ha'apai and Vava'u is about 78° F. and in Niuatoputapu and Niuafu'ou about 80° F.

Humidity is considerable, but varies in the different islands of the group. On Tongatapu and Ha'apai the mean annual figure is usually between 78 and 80 per cent. On Vava'u it is usually between 75 and 78 per cent., while on Niuatoputapu it is usually between 78 and 82 per cent., and on Niuafu'ou between 80 and 85 per cent.

Rainfall tends to be rather low and variable; it is much less than in Fiji or Samoa. No long unbroken series of figures of annual rainfall has been recorded, but Fig. 12 shows the available results for Tongatapu since 1917, first at the agricultural station at Vaikeli and then at Nuku'alofa. It will be seen that for a period of rather more than twenty years rainfall has varied between 40 and 80 in. per annum, with an average of about 65 in. per annum. In 1930, the year of lowest rainfall, the prolonged drought caused a heavy fall in copra production in Tongatapu and Ha'apai. As with temperature, rainfall increases considerably as one moves northwards through the group, until the annual average for Niuafu'ou is nearly double that for Tongatapu or for Ha'apai (Fig. 13).

Rain normally falls in every month, on an average about 170 days in the year. It is customary to say that there is a wet season from December to April, with lighter rainfall in the remaining months, and an occasional short but injurious drought between October and December. This is broadly true if monthly averages are taken over a period of years, but no regularity can be expected in any one year. This can be seen from Figs. 11 and 14, where the mean monthly rainfall at Nuku'alofa for the period 1929-40 can be compared with what actually happened in nine sample years. Rainfall has usually been heavy at the turn of the year, but occasionally months of this wet season, as February 1931, December 1937, and January and February 1940, have been the driest of the whole year. And in at least two cases, 1930-1 and 1931-2, there was less rain in the December-April period as a whole than in the next five months. Moreover, though October and November tend to be the months of drought, in four of the years considered—1929, 1936, 1938 and 1940—more rain fell in these two months than in June and July. Hence the visitor to Tonga should not expect a regular seasonal cycle comparable, say, with the monsoon of India.

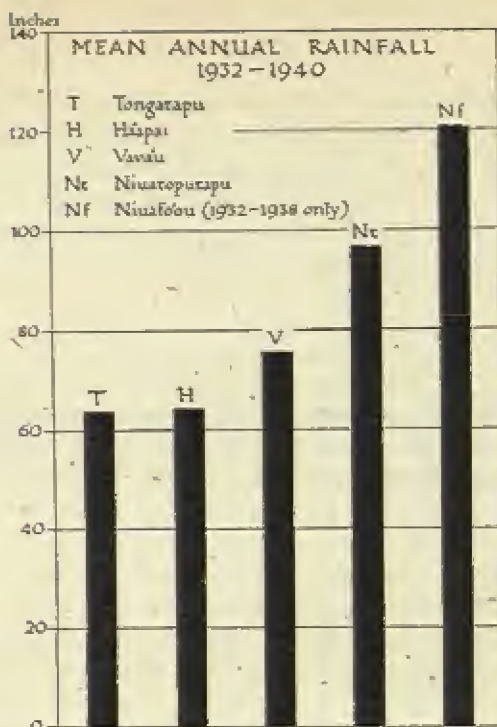


Fig. 13. Mean annual rainfall in major islands of the Tonga group, 1932-40. Note the increase in rainfall from south to north of the group. Based on: (1) *Tonga Government Gazette* (Nuku'alofa, 1932-9); (2) *Agricultural Department Report* for 1940—no data given for Niuafōu (Nuku'alofa).

MONTHLY RAINFALL, NUKUALOFA (Mean compared with sample years)

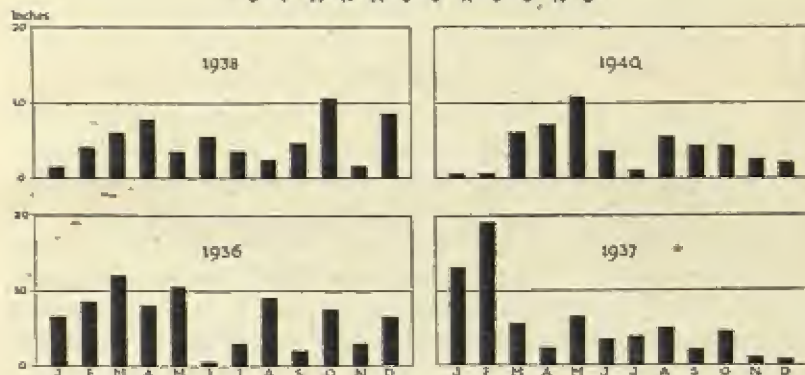
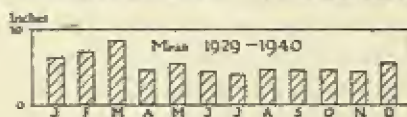


Fig. 14. Monthly rainfall, Nuku'alofa, Tonga, 1929-40

The mean is compared with sample years; other sample years are given in Fig. 12. Based on: (1) *Tonga Government Gazette* (Nuku'alofa, 1929-39); (2) *Agricultural Department Report* for 1939-40 (Nuku'alofa).

Some meteorological records have been taken on Tongatapu for many years past, but they do not give a good indication of conditions in the group as a whole. In 1931, however, the number of meteorological stations was increased to five, one in each of the major groups, and monthly figures of temperature, humidity and rainfall from them are now published officially.

SOIL

The soils of Tonga appear to be very fertile, but as yet little study has been made of them. Most of the surface soil of Tongatapu is reddish brown and of friable texture. It swells considerably when wet and readily crumbles to dust when dry, so that it does not lose water too easily by evaporation, and has also the advantage of being easy to keep free of weeds by simple cultivation. Microscopic examination suggests that it is derived from volcanic ash. The sub-soil is paler and more clayey in texture, but with considerable variation; a compact bluish clay has even been reported beneath reddish brown clays, but this needs confirmation. Decomposing coral limestone lies below the sub-soil at depths varying from 3 to 10 ft. Along the south coast, however, extensive limestone outcrops occur, while along the low-lying flats of the north coast the soil is intimately mixed with coral and shell sand. The soil suffers little from water erosion, and the thick vegetation hinders wind erosion.

On 'Eua there is a great deal of red volcanic soil, while on Vava'u the coral rock is mostly covered with a reddish brown clay, in parts many feet thick, though in others the vegetation has helped to produce a black mould. On Niuafu'ou and the other volcanic islands to the north and west much of the soil is deep and black.

VEGETATION

The vegetation of the Tonga islands is luxuriant and gives them the same appearance of greenness and fertility which is characteristic of the neighbouring groups. Since there is much good soil, cultivated land occupies a larger proportion of the area than in most of the Pacific islands, and the amount of wild vegetation is correspondingly small. In former times, as at the end of the eighteenth century, the cultivated area may have been even larger; much apparently natural vegetation grows on land which was formerly cultivated.

Many kinds of tropical plants are grown, such as banana, yam,

taro, sweet potato, manioc, pineapple, papaya, sugar cane, and, near the coasts, coconut palms. Maize has proved the best cereal for the climate. Besides the more important crop plants, breadfruit, custard apple, mango, orange and many other fruit trees grow scattered among the huts of the villages. Tobacco and kava (*Piper methysticum*), from which the national drink is made, are grown everywhere. Many of the useful plants are of early Polynesian introduction. Others of more recent trial are coffee, cocoa and cotton; various European vegetables, including tomato and pumpkin, do well.

As in most Pacific islands, introduced weeds run riot. The sensitive plant (*Mimosa pudica*), with its unpleasantly prickly stems, is the commonest weed by roadsides, but is less disagreeable than the grass *Chrysopogon aciculatus*, the fruits of which stick to clothing and soon produce irritating sores.

The native flora is not very rich, partly owing to the lack of high mountains. It is best seen on Vava'u and the higher parts of 'Eua; Tongatapu is so intensively cultivated that little natural vegetation is left. There is a marked difference between the vegetation of the upraised coral limestone and the volcanic soils; certain plants, e.g. the white-flowered shrub *Melastoma denticulatum* and certain ferns, are rarely or never seen except on the volcanic areas.

Vava'u still has a considerable area of forest, though most of it is probably secondary, growing on land which has at some time been cultivated. Along the low southern coast there is some mangrove swamp and in many places a belt of beach forest formed of trees such as *Thespesia*, *Calophyllum inophyllum* and *Gymnosporium vitiense*. Creepers bind this forest into a solid wall so that little of the interior of the island can be seen from the sea. Towards the *liku* (the northern coast) the country is open and the uplands are covered with grassy savannahs sprinkled with pandanus and casuarina trees.

The vegetation on the higher parts of 'Eua is unlike anything in the rest of the group. The eastern side of the main ridge consists of bare limestone cliffs broken here and there by steep forest-covered slopes. In contrast to this the western side has wide open stretches of savannah covered with coarse herbage and scattered pandanus trees. Alternating with the savannah and usually following the valleys there are patches of luxuriant rain forest. Seen from the ridge above, the great crowns of the tree ferns form a striking feature. The edge of the forest is covered with a mass of creepers, among them convolvulus with sulphur, purple or blue flowers; but once within the forest one has no difficulty in making one's way about.

Along the east coast of 'Eua the *piu* palms (*Pritchardia pacifica*), with their fan-shaped leaves and stems 60 ft. or so high, make a fine sight. Other beautiful trees of the islands are the red-flowered *jekika* (*Eugenia malaccensis*), the Tahitian 'chestnut', the coral tree (*Erythrina*) and the graceful *tavahi* (*Rhus taitensis*).

FAUNA

The native fauna of the islands is comparatively scanty. Snakes are unknown, but there are several species of lizards. Insects are numerous, including mosquitoes, and there are also centipedes. Apart from fruit bats (often called 'flying foxes') there appear to be no mammals not introduced by man. Pigs, fowls and rats seem to have been brought to Tonga many centuries ago, before the coming of Europeans. Captain Cook presented the first horses, cows and sheep to Tongan chiefs in 1777; the cattle were known as 'Cook's pigs' by the people, thus giving rise to the statement that Cook brought pigs to Tonga. Goats and other domestic animals, as well as turkeys and other poultry, were introduced by other Europeans later. One of Cook's most notable introductions was a pair of land tortoises, the male of which still survives (though he is blind) and is treated with great respect by the Tongans, who have given him the chiefly title of Tu'i Malila.

Birds native to the islands include an owl, a swamp-rail, a kingfisher and a fruit pigeon (*Globicera pacifica*)—though the last is said to migrate from Samoa to Tonga in large numbers in October and to return in March. Pigeon-snaring was in former times one of the most popular sports of chiefs, and the birds might be eaten only by them.

HISTORY

Traditional Political System

Some knowledge of Tongan tradition and political organization is necessary to an understanding of the modern history of the islands.

Until comparatively recent times, the supreme chief in Tonga was the Tu'i Tonga, a sacred king who was the highest representative of the gods on earth, and to whom annual tribute and firstfruit offerings were made from all the islands of the group. The first Tu'i Tonga, according to myth, was the son of the god Tangaloa and a woman of Tongatapu. Various subsequent holders of the office met violent deaths, and finally, in approximately A.D. 1470, the twenty-fourth

Tu'i Tonga changed the political system. He reserved for himself and his successors the spiritual status and leadership, but handed over the burden of government and the temporal power to one of his brothers, who began a new line under the title of Tu'i Ha'a Takalaua. Henceforth the Tu'i Tonga remained the divine king, but inevitably his real influence declined. At this time also governors were sent to control 'Eua, Ha'apai, Vava'u, Niuatoputapu and Niuafo'ou. In the time of the sixth Tu'i Ha'a Takalaua a similar splitting of authority took place, this temporal ruler creating for his son a new title, that of Tu'i Kanokupolu, and giving him the burden of ruling and collecting tribute, while keeping for himself privileges of higher rank. This event took place about A.D. 1600. The holder of the office of Tu'i Kanokupolu thus became the effective temporal ruler of the islands. The position of Tu'i Ha'a Takalaua tended to become redundant, so that in 1799 the senior title became merged in the junior one, though the men who would otherwise have succeeded in turn as Tu'i Ha'a Takalaua were still held in great respect.

In the changes consequent upon the coming of Europeans to Tonga, the office of Tu'i Kanokupolu grew in status. Finally, the holder assumed full sovereignty over the group, effectively displacing the Tu'i Tonga entirely, since the religious functions of the latter had disappeared with the acceptance of Christianity by the Tongan people. The last Tu'i Tonga died in 1865, and after his death the title was absorbed with all its remaining dignities by the Tu'i Kanokupolu, who by then had become King. The present sovereign of Tonga, Queen Salote, thus represents the ancient offices of Tu'i Tonga and Tu'i Kanokupolu. Through her and her consort, the late Prince Tungi, who would have been Tu'i Ha'a Takalaua if the title were still current, her son the Crown Prince combines in himself all the three most eminent chiefly lines in the state. The modern political system thus preserves a continuity with the ancient polity of the group.

Period of Upheaval

European contact with Tonga began in 1616, with the visit of Le Maire and Schouten to Niuatoputapu and Niuafo'ou. More extensive was the visit of Abel Tasman in 1643, 'Ata, Tongatapu and Nomuka being described by him. In 1767, Wallis, the first Englishman to visit Tonga, called at Niuatoputapu, while Cook called at the islands twice on his second voyage, in 1773 and 1774, and again on his third voyage, in 1777. On this last occasion he discovered Lifuka, in the

Ha'apai group, and called it Friendly island, a name afterwards applied for a long time to the group as a whole. Cook stayed in the Tonga group for over two months, witnessing among other customs the presentation of firstfruits to the Tu'i Tonga at Tongatapu. From this time on, to the close of the century, various other voyagers visited the group, including Maurelle in 1781, La Pérouse in 1787, Bligh in 1789, Edwards in 1791 and D'Entrecasteaux and Labillardière in 1793. In 1797, ten missionaries from the London Missionary Society were landed from the *Duff*. Their arrival practically coincided with the outbreak of a period of disorder and civil war in the islands, so that their work proved ineffective. Three of them were killed when hostilities began in 1799, one had already abandoned the community and joined the entourage of a Tongan chief, and the others were taken off to Sydney by a passing vessel in 1800, without having obtained a single convert.

Affairs in Tonga at this time were dominated by the rivalries of ambitious chiefs, and were precipitated by the murder of the Tu'i Kanokupolu in 1799, at the instigation of Finau Ulukalala II, one of the chiefs of highest rank in Vava'u. As the primary seat of the Tu'i Kanokupolu (as also of the Tu'i Tonga) was in Tongatapu, the ensuing warfare tended to assume to some extent the character of a struggle between these northern and southern islands, though partisans of the various leaders were to be found all through the group. Fighting in one or other part of the islands was almost continuous till 1809. Finau Ulukalala, a skilful and unscrupulous leader, succeeded in gaining unquestioned rule over Vava'u and Ha'apai, and in intermittent conquest of Tongatapu. In 1809, however, he died, in popular belief because of his irreverence towards the ancient gods. During the greater part of this decade, as the result of the wars of Finau, and of other chiefs among themselves, the people of the islands, especially Tongatapu, tended to desert their open dwellings and concentrate in forts for protection. Cultivation declined, famine was prevalent and many of the people perished from this alone. Tonga became notorious because of attacks upon European vessels, the desire of the chiefs being to secure stores, tools and guns. In 1806, the *Port-au-Prince*, an English privateer, was cut off at Lifuka by the orders of Finau. Among the few sailors spared was a youth, William Mariner, who remained in Tonga for four years under the protection of Finau, and whose record of his experiences and of life in Tonga at the time forms one of the most valuable accounts of contemporary conditions.

After the death of Finau Ulukalala, affairs became more settled in Vava'u and Ha'apai, but spasmodic fighting continued in Tongatapu, where the office of Tu'i Tonga lay in abeyance from 1810 till 1827; that of Tu'i Kanokupolu was vacant from 1800 to 1812, and again from 1820 to 1826. The power of the former office had so declined that, when the last of the Tu'i Tonga title-bearers was appointed in 1827, he no longer received the tribute which had formerly been compulsory.

Rise of Tupou

From 1820 onwards a new power began to arise in Tonga, that of Taufa'ahau, son of the late Tu'i Kanokupolu. This man, afterwards known as Tupou (Tubou) I, became the creator of the modern Tongan state. Till 1833 he was occupied mainly in consolidating his rule in Ha'apai, a district which he had inherited from his father. His chief opponent was Laufilitonga, who later became the last Tu'i Tonga. At first merely a struggle on the part of Taufa'ahau to retain his inheritance, the fighting later assumed the form of a war between the representatives of a new order, including Christianity, and those of a more conservative state of affairs. After an abortive beginning in 1822, the Wesleyan mission had become established in Tongatapu in 1828 and 1829. In 1831, Taufa'ahau was baptized under the name of George (Siaosi) and his wife under the name of Charlotte (Salote), these names being chosen in imitation of George III of England and his Queen. In 1833, Taufa'ahau was accepted as ruler of Vava'u, and by 1835 both Ha'apai and Vava'u were nominally Christian. Tongatapu, however, was still divided, partly by religion and partly by the weakness of the Tu'i Kanokupolu (nominally a Christian), whose rule was not very effective. In 1837 and in 1840 he called on his nephew Taufa'ahau for help, and the non-Christian chiefs and their followers were defeated on the first occasion with considerable slaughter. From contemporary records, it is impossible to see how far Taufa'ahau was actuated by motives of political aggrandisement and how far by the desire to extend the gospel, but both were present. These interests were certainly parallel. In 1845 the Tu'i Kanokupolu died, and Taufa'ahau was chosen as his successor, assuming thereby the family title of Tupou, and becoming King of all Tonga. When in 1865 the Tu'i Tonga also died, Tupou was invested at Vava'u with that title and its honours. But he preferred not to use it, and Tu'i Kanokupolu remains the hereditary title of the Tongan monarchs, as evidenced in modern proclamations and

in the formal kava ceremonies. The holder of what was originally the third office in the land has thus become the supreme ruler.

George Tupou I was a remarkable personality. Born in 1797, he lived till 1893, being acknowledged sovereign of Tonga for nearly fifty years. Under his able reign, the land emerged from heathenism and disorder to a settled, Christian, and comparatively peaceful state; it had a code of laws, a constitution, and a political organization which maintained it on the whole in a noteworthy condition of independence at a time when the other kingdoms of the Pacific were falling one by one under direct European rule.

Shortly after his accession, however, Tupou had to fight to maintain his ascendancy. The desire of some Tongatapu chiefs for independence, accentuated by the cleavage between Christians and heathens, led to the last Tongan war, in 1852. The situation was complicated by the presence of Roman Catholic priests, who had established themselves among the heathen at Pea in 1842, and who had gained among others the Tu'i Tonga as a convert. The contending parties were not clearly differentiated along sectarian lines, but the result of the struggle, in which the King's opponents were soon decisively defeated, was the end of heathenism and also of Roman Catholicism in the group. Protestantism and the Sovereign triumphed together.

In 1853 the King visited Sydney, receiving there many ideas, notably on the system of land tenure, which he put into effect in Tonga on his return. Two years later he went to Fiji, where he assisted King Thakombau to restore his authority (p. 132). In 1855 also he signed a treaty with France, promising among other things protection for French subjects in Tonga and assistance to French ships in Tongan waters. The treaty was signed by Tupou under some degree of compulsion, but it was the first official recognition of his sovereignty by a foreign Power.

Stabilization of the Kingdom

The King was now free to turn his attention fully to internal affairs. As early as 1839 he had promulgated a code of laws for Vava'u, drawn up with the advice of the missionaries but largely of his own composition. This, the first body of written law in Tonga, had directed the chiefs to give land to their people, who were instructed to cultivate it properly, and laid down regulations about pigs, games, marriage, the selling of alcohol and the establishment of monthly courts. Crude though its formulations were, they primarily

defined in simple clear language duties already recognized by the people as reasonable. A similar code was applied in 1850 to the whole of Tonga. This in turn was enlarged in 1862. Following the example of Hawaii and on the advice of the missionaries the common people were set free from forced labour for their chiefs, and from making compulsory contributions to them, and were given complete control over their own property. At the same time a Parliament of chiefs and representatives of the people was set up, poll tax and land rent were instituted, and the principle laid down that officials were to be paid and all other national expenses also met out of government revenue. The code was passed by the new legislators at Nuku'alofa, the capital, to the accompaniment of feasting which lasted nearly two months and accounted for 9,000 pigs. Parliament met infrequently, however, and for fourteen years there was no Cabinet and no Premier. In effect the King continued to rule as before.

In 1875 the code was developed still further into a constitution, and Tonga became in form at least a limited monarchy on the British model. The main provisions of the constitution, which like the earlier codes owed much to mission influence, were a declaration of rights in regard to freedom of property and worship; a definition of the form of government in terms of King, Privy Council and Cabinet, Legislative Assembly and Judiciary; regulations about land holding; and laws of succession to the throne and to titles of nobility. In the following year the principal Cabinet and other officers were appointed and the first Government Gazette was issued, in English.

In 1876 a treaty with Germany was signed. In it the independence of Tonga and the sovereignty of Tupou were recognized, and the main provisions gave to Germany the right to a naval coaling station on Vava'u and rights of trade. In 1879 a treaty was signed with Britain, giving trade rights and the right to the British consul to try British subjects in certain cases. This was ratified in 1881. In 1888 a treaty with the United States of America also provided for trading rights and a naval coaling station.

Political Difficulties

In the formulation of the new constitution and the treaty negotiations, as well as in other acts of the government, Shirley Baker, a missionary, played a prominent part. A man of ability and great force of personality, he had come to acquire considerable influence over the ageing King. In 1880 he resigned from the Wesleyan ministry

and became Premier of Tonga, Minister for Foreign Affairs and Minister of Lands, holding these and other positions till 1890 and becoming almost a dictator. His power lay at the discretion of the King, but the secret of it lay primarily in the King's fear of losing the independence of Tonga to a foreign country (as that of Fiji had been lost to Great Britain) if he were deprived of Baker's advice. Under Baker's aegis a number of far-reaching changes were made. In 1880, for instance, hereditary estates were conferred on thirty nobles and six non-chiefly officers (*matapule*); and in 1882 the government established the government college and took over the primary schools of the kingdom from the missions. But the most spectacular event was the setting up of the new Free Wesleyan Church in 1885. The King and people for some time had had a grievance against the Wesleyan Conference in Australia, which controlled Tongan church affairs. Every year the Tongan mission collected for church purposes large sums that were not spent in Tonga but were transferred by the conference to some other more needy circuit. It was felt by many Tongans that this money ought to be spent for the benefit of those who had contributed it. Refused a separate conference, with control over its own finances, the King, backed by Baker, set up a new Free Church which was joined by the majority of Tongans. A minority, however, remained adherents of the old Wesleyan Church. In 1886 an attempt was made to shoot Baker, the reason being political rather than religious feeling, but on the latter excuse hundreds of men were brought from Vava'u and Ha'apai to attack the people of Tongatapu who had refused to join the Free Church. After much disorder and persecution 200 Wesleyans were exiled to Fiji, and others were sent to uninhabited islands such as Tofua and Tonumea. Six men had already been tried and shot in connection with the original outrage.

For some years past British High Commissioners had looked askance at Baker's despotic rule, but they had not removed him from fear that such a course would lead to a breakdown of law and order. The reports received at this time led to a further consideration of the matter. The High Commissioner visited Tonga. He reported that the constitution had been violated and that assaults, robberies and irregular imprisonment had been allowed to occur for some months past. He warned Baker but still did not care to remove him. In 1890, however, as the result of continued malpractice and the slanderous allegations he issued about the authorship of the attack upon him, Baker was deported from Tonga. Siaosi Tuku'aho, a

relative of the King, was appointed Premier, with Mr (afterwards Sir) Basil Thomson as Assistant Premier.

Thomson, seconded from the Fiji service, had the task of ordering the finances and the laws of the country, which Baker had thoroughly disorganized. He had kept no proper accounts and had issued many unsystematized laws, some published in English only, and some not printed at all. In their discontent many people had refused to pay taxes and the revenue position of the government was most serious. Under Thomson's guidance it was enacted that any man liable to pay poll tax and neglecting to do so for three years lost his land; the poll tax was thus virtually turned into a land tax. Rent for land leased from the hereditary estates of nobles was ordered to be paid to the government, who refunded it to the landlords. The laws were also compiled and rearranged into the code of 1891.

In 1893 George Tupou I died, having by his strong personality and wisdom guided his country through a difficult period of transition, accomplished her unity, secured for her at least a form of independence, and provided her with the elements of parliamentary government, educational facilities, and a very useful land system. His successor, George Tupou II, was his great-grandson.

Protection by Britain

By the end of the century Tonga was again in financial difficulties, and to obviate annexation of the country by another foreign Power Great Britain resolved to take Tonga under her protection. The Treaty of London between Germany and Britain in 1899 conceded to Britain any former rights held by Germany in Tonga, while Britain consequently withdrew from Samoa in favour of Germany and the United States of America. With Tonga a Treaty of Friendship and Protection was signed in 1900 and ratified in 1901. By this Tonga agreed to leave all relations with foreign Powers in the hands of Great Britain, and in return for protection to allow British war-ships access to Tongan ports at all times and the use of any places as coaling stations or forts. The British Agent and Consul was not to interfere in internal affairs except where the interests of British subjects were concerned, but could advise the King on local policy, and had the right of trying British and other foreign subjects in the Consular Court.

In 1905 a review of these provisions was made in consequence of continued maladministration, particularly in financial matters. Sir Everard im Thurn, High Commissioner for the Western Pacific,

visited the group and found that the constitution, while admirable in tenor, was too advanced and complicated in form, and moreover was being added to and interpreted at will by the King and a small group of his advisers. The Cabinet was a family affair, and officers had been selected for important legal and other posts, often with no knowledge of the subjects required. Payments were often made at the will of the King and his associates without reference to the estimates, and no accounts were published. But the main cause of trouble was the land situation. The assignment of lands instituted by Tupou I had not been completed; some portions of land assigned had been taken away from holders or their heirs and reassigned; when land was leased not only was the lease arranged by the government but the King retained the rent; the rent from public lands reserved to meet public expenditure was drawn upon by the King for his personal benefit; and portions of land reserved for the government were assigned by the King to private individuals. Faced with the prospect of his own removal and the annexation of Tonga, the King accepted an agreement supplementary to the treaty by which these financial and other matters were regulated, and the advice of the British Agent and Consul was to be taken with especial reference to the estimates. The latter's consent to the appointment of any European to the service of the Tongan government was also made necessary.

From this time the course of Tongan political history has been comparatively smooth. In 1914 the number of members of Parliament was reduced to seven nobles and seven representatives of the people in addition to the Cabinet, and from then on Parliament has met annually. During the war of 1914-18 a number of European residents and English-speaking Tongans enlisted with the New Zealand forces and large sums were raised for patriotic purposes. In 1916 the Treaty of Friendship with Germany was annulled and German firms in Tonga were closed down. In 1918 George Tupou II died, and was succeeded by his daughter, the present Queen Salote Tupou, who had married Prince Tungi. In 1923 the Prince Consort became Premier; he died in 1941.

Policy of Development

During the last twenty years an active policy of economic and social development has been followed by the Tongan government, though hampered by the economic depression of 1930 and subsequent years. The population of the islands has been increasing and,

while it has been estimated that there is still plenty of available land, the government has endeavoured to promote more efficient methods of cultivation and to distribute the population more evenly. Export markets for the local products, particularly bananas, have been sought by the government, and communications, health and educational services have been greatly developed. In 1924, in the interests of Tongan unity, the Queen attempted to reunite the Wesleyan Church to the Free Wesleyan Church, of which she was a member. But this aim was only partially achieved, since a minority of the latter body refused to enter the union and formed a separate church. The younger members of the Royal House have been educated to take a practical part in the affairs of the kingdom. The Crown Prince Taufa'ahau Tupouto'a, having graduated in Arts at the University of Sydney, continued to take a degree in Law, and in 1943 became Minister of Education in the Tongan government. One of his brothers has been trained in agriculture, also at Sydney. But while adopting the forms of government and material advantages of European civilization, the Queen and her ministers and chiefs have striven to retain all that could be useful in Tongan institutions and ways of life, recognizing their value against the traditional background and natural environment of the people.

GROWTH AND DISTRIBUTION OF POPULATION

The population of Tonga does not seem to have suffered that devastating reduction in numbers so characteristic of many of the Pacific island communities after the coming of Europeans. On a careful estimate* the population of the three main island groups, Tongatapu, Ha'apai and Vava'u, probably never exceeded 25,000 before the advent of Europeans. The statements of Captain Cook, which would seem to indicate much larger numbers of inhabitants in 1777, have apparently neglected the way in which people from other islands would tend to be drawn by the novelty of his visit to assemble at the spot where he was. An estimate by the Wesleyan missionaries in 1840, cited by Captain Wilkes, allows only 18,500 for the population of the whole archipelago, including the outlying Niuatoputapu and Tafahi but excluding Niuafu'ou. Considering that the country was still suffering at the time from the

* E. W. Gifford, *Bernice P. Bishop Museum Bulletin*, no. 61, p. 4 (Honolulu, 1929). Basil Thomson (*Diversions of a Prime Minister*, p. 372, London, 1894) did not believe that the population of Tonga ever greatly exceeded 20,000.

effects of the internecine wars which began about the beginning of the century, this figure is possibly not an underestimate. In recent times a census has been conducted at intervals by the police. Though the method may seem somewhat haphazard, in a country where every individual is personally known (if not related) to the enumerator not many omissions are likely. The results from 1890 onwards,

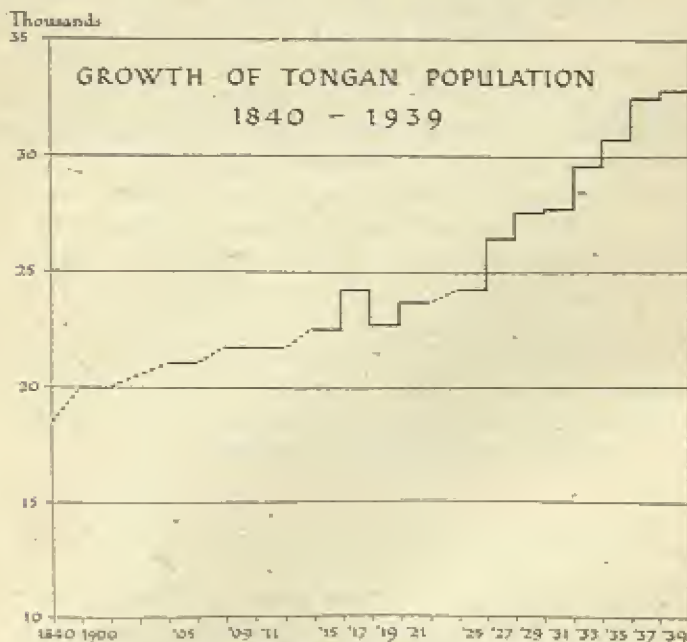


Fig. 15. Growth of Tongan population, 1840-1939

The graph is schematized; gaps in dates at the bottom of the figure indicate lack of information. The population for 1840, from a mission estimate, excludes that of Niuafu'ou. Some of the earlier figures are also estimates, but most are from the police census (since 1931 taken annually). All figures except those for 1804 are said to refer to 'full-blooded' Tongans only. Based on: (1) E. W. Gifford, *Bernice P. Bishop Museum Bulletin*, no. 61, p. 6 (Honolulu, 1929); (2) A. H. Wood, *History and Geography of Tonga*, p. 90 (Nuku'alofa, 1932); (3) *Colonial Office Annual Report for 1923-38* (London); (4) *Tonga Government Gazette* (Nuku'alofa, 1922-41).

together with certain estimates, are given in Fig. 15, which shows that the native Tongan population has increased by approximately 70 per cent. in the last half-century, the rise being most rapid in recent years. A serious epidemic of measles reduced the population in 1893, and a fall occurred in 1918-19 as a result of the influenza epidemic.

Elements other than native Tongan are comparatively small, repre-

senting at the present time little more than 3 per cent. of the total population. In the census of April 1938 there were 407 Europeans, 477 'half-castes' (mainly of mixed Tongan and European blood), 302 natives of other Pacific islands, and 198 others (mostly Asiatics). The only element that shows indications of fairly consistent increase

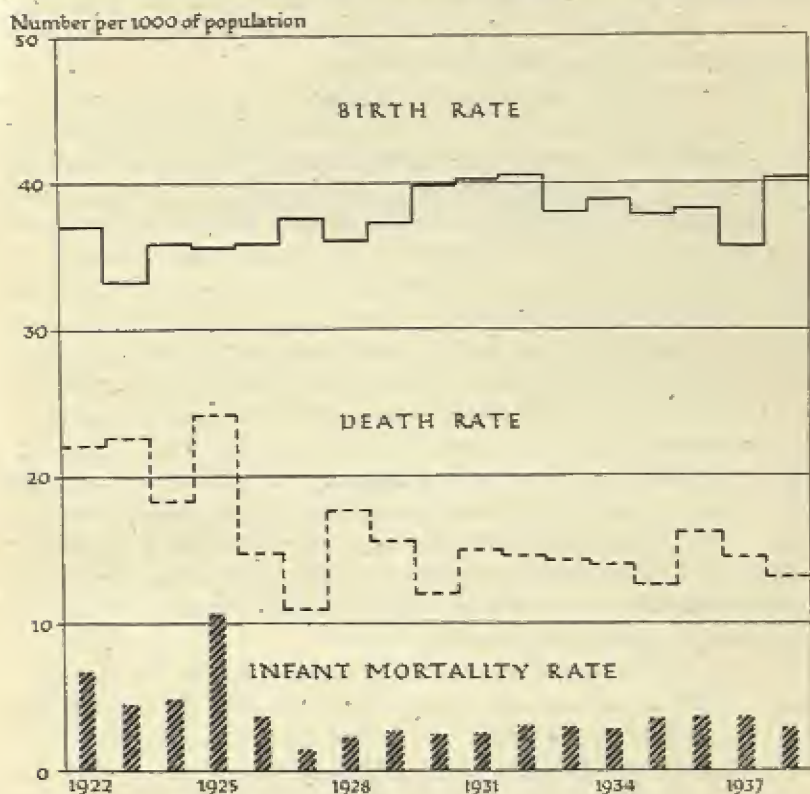


Fig. 16. Tongan birth and death rates, 1922-38

Birth, death and infant mortality rates are all compared directly per thousand of population. Based on data from *Tonga Government Gazette* (Nuku'alofa, 1922-41).

is that of the mixed-bloods, who numbered only 235 in the census of 1921. Intermarriage between Europeans and full-blooded Tongans was never common, and is even less frequent today; the increase of mixed-bloods is due primarily to the union of 'half-castes' with Tongans. But the infiltration of white blood by this means is tending to grow, and a recent observer states that a considerable proportion of those officially classed as 'full-blooded Tongans' have some

admixture of foreign blood (mostly European). The effectual prohibition of ownership of land by foreigners, however, tends to obviate any large scale foreign settlement and consequent racial intermixture. Asiatics in particular are not attracted to the country, and those who have come in recent years are mainly Japanese store-keepers and photographers, and Indian tailors, saddlers and house servants. The Europeans are primarily government officials and men engaged in commerce, with their families.

The trend of the native Tongan population may be seen further from Fig. 16, which shows the comparative movement of birth and death rates per 1,000 of population during the period 1922-38. In general the birth rate has risen slightly during this period, while the death rate has declined to a rather greater extent. Both rates are much higher than those prevailing in countries such as Australia and New Zealand. The infant mortality rate is also high, reaching a peak of 295 infant deaths per 1,000 births during the period under consideration, but dropping away in recent years to an average of about 75 deaths per 1,000 births. Considering, however, that the actual number of births per annum is not much in excess of 1,000, much weight cannot be given to small fluctuations in the infant mortality rate per mille of births. In Fig. 16 the infant mortality rate is shown per 1,000 of population, thus giving direct comparison with the birth rate. This shows that after the heavy incidence of infant mortality in 1925 the proportion of infant deaths has been fairly constant at about 10 per cent., though it has displayed a slightly rising tendency in recent years.

The density of population for the group as a whole is moderately high; as calculated from the census of 1938 it was 125 persons per sq. mile. But nearly one-fifth of the total land area consists of uninhabitable or practically useless islands. If these be excluded the density of population in 1938 was 149 per sq. mile. But the distribution of population among these inhabited islands is uneven, the heaviest concentration by far being in the Ha'apai group, and the lightest in 'Eua. The following Table shows the area of the inhabited islands and the density of the population in each group or large island at three representative periods since the beginning of this century. (Full-blooded Tongans only have been considered.)

Area and Density of Population at Three Periods

Group or Island	Area of inhabited islands (sq. miles)	Density of population per sq. mile		
		1900	1918	1938
Tongatapu	100.3	76	96	145
'Eua	33.7	13	12	14
Ha'apai	19.8	265	311	366
Vava'u	46.0	100	123	176
Niua-toputapu	7.2	99	115	113
Niuafo'ou	19.4	56	58	67

Based on: E. W. Gifford, *Bernice P. Bishop Museum Bulletin*, no. 61, p. 6 (Honolulu, 1929); A. H. Wood, *History and Geography of Tonga*, p. 108 (Nuku'alofa, 1932); *Tonga Government Gazette*.

For the major groups, Tongatapu, Vava'u and Ha'apai, the present density of population is inversely proportional to the size of the group, but the trend of increase since 1900 is tending to some extent to redress the balance. While the increase of density in Tongatapu has been about 83 per cent. and that of Vava'u about 75 per cent., that of Ha'apai has been less than 40 per cent. Little change has taken place in the density on the other islands.

One feature of the Tongan population (in recent years at least) has been a fairly constant excess of males, who represent about 52 per cent. of the total as against about 48 per cent. of females. No adequate data are available on age distribution or on differential sex mortality at different ages, but it would appear that the excess of males occurs mainly among the younger section of the population.

Settlements

The population of Tonga for the most part is distributed in villages of moderate size and with one or more churches and stores or trading stations. The distribution on Tongatapu is shown in Fig. 17. Only four settlements in the group are large enough to be termed towns. These are Nuku'alofa and Mu'a on Tongatapu, Pangai on Lifuka and Neiafu on Vava'u (Plate 3).

Nuku'alofa, the capital of Tonga, with a population of over 3,000, is situated on the flat, low northern side of Tongatapu. Public buildings and private houses are set among trees and flowering shrubs, and many of the streets are wide and turf-covered, with open green spaces. The Royal Palace (Plate 9) and Royal Chapel are conspicuous, close to the beach, and behind the British con-

sulate is a small hill known as Zion, the site of an old fort described by Mariner, and now crowned by a church overlooking the town. The town is the centre of trade for the whole group, and the principal port. From it good roads lead out to the other parts of the island, and motor-cars are available for hire. There are no hotels, but a boarding house provides accommodation for visitors, and there are amenities including clubs, and supplies of fresh meat, milk, eggs, poultry and ice. Fresh vegetables are readily obtainable, except from December to April, when they are scarce.

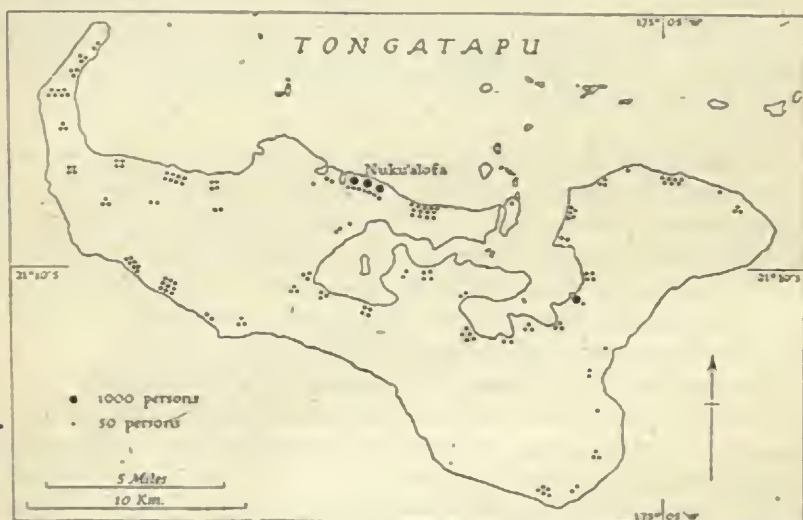


Fig. 17. Distribution of population in Tongatapu, 1931.

Based on data from A. H. Wood, *History and Geography of Tonga*, pp. 95-9 (Nuku'alofa, 1932).

Mu'a, situated to the east of the deep inlet known as Fanga 'Uta, was the ancient capital of Tongatapu. Near it are the remarkable series of *Langi*, the tombs of the ancient kings, terraced pyramidal structures built of blocks of stone, the largest of which weighs 30 tons. Mu'a consists of two villages, Tatakamotonga and Lapaha, which have a total population of rather more than 1,000. Pangai, with a population of nearly 1,000, is the principal settlement of Ha'apai, and serves the port of Lifuka. It was formerly the home of King George Tupou I, and is now the residence of the Governor of Ha'apai. Neiafu, the principal port of Vava'u and the residence of the Governor of the district, is beautifully situated on an arm of the sea, running up between 'Uta Vava'u and the island of Pangaimotu.

It has a population of nearly 2,000. Good roads radiate out from it to the other settlements on the island, and motor-cars are available.

THE PEOPLE

PHYSICAL TYPE

The Tongans belong to the Polynesian ethnic group, and correspond most closely in their physical characters to the Samoans, though showing rather more variation of type.

As a group the Tongans are among the tallest of mankind. In a sample the average stature of men was 5 ft. 8 in., with a range between 5 ft. 3 in. and 6 ft. 1 in., while that of women was about 4 in. less, with a range between 4 ft. 11 in. and 5 ft. 11½ in. In physique the people are well developed, though often inclined to stoutness in later life. The Tongan head form is long and broad, with an average cephalic index of about 81. In some cases the cephalic index is as high as 92, but this may be due to artificial flattening of the skull, possibly through the use of the wooden pillows which are still in vogue. The face as a whole is broad and massive, the nose is large, with somewhat oval nostrils, and the lips are of medium thickness and well formed, often with a 'chiselled' appearance. The eyes are dark brown, with a considerable amount of conjunctival pigment. The epicanthic fold (which gives an oval, 'almond-shaped' appearance to the eye) is absent in the majority, though there are a few marked examples, and traces of it can be seen in about 30 per cent. of cases. Normally the eyes are less widely open than those of Caucasian peoples.

The skin of Tongans is of a medium yellowish brown shade where it is not exposed to sun and wind, but the exposed parts may reach a very dark chocolate brown colour. The hair is black, of medium coarseness, and is either straight or slightly wavy. Though luxuriant on the head, it is only moderately developed on face and body.

LANGUAGE

Tongan is one of the major languages of the Polynesian group. Phonetically it has much in common with Samoan; for instance, they both use the consonant *l* instead of the *r* used in Tahitian and in Maori, and *f* and *v* instead of the corresponding Maori *wh* and *w*. Thus for the Maori *whare* (house) and *wai* (water) the Tongan uses *fale* and *vai*. But Tongan has several phonetic differences from

Samoa. It uses the *k* sound where Samoan has only a glottal closure. The Tongan *kava*, the favourite beverage, thus corresponds to the Samoan *'ava*. Tongan also uses the *k* sound freely where Samoan employs *s* or has no consonant at all. The Tongan word *hala* corresponds to the Samoan *sala* (error), as well as to the Samoan *ala* (path or road). But, on the other hand, Tongan inserts a glottal closure in many words from which it is absent in Samoan; the word *ha'u* (come) in Tongan is represented in Samoan by *sau*.

Difficulty has arisen in the past over the spelling of Tongan words. In reducing the language to writing the early Wesleyan and Roman Catholic missionaries who were responsible did not follow the native pronunciation consistently. They did not omit the glottal closure, as was commonly done by missionaries in Tahiti and other Eastern Polynesian areas. But as in Samoa and some other parts of Oceania they wrote the nasal *ng* sound (as in the English *sing*) as a *g*. This became the accepted usage, in government publications as well. Thus the name of the group, though always pronounced Tonga, was written locally Toga and appeared in this form on postage stamps. The spelling was also complicated by failure of the missionaries to agree among themselves how certain other Tongan sounds should be represented. In Tongan the difference in pronunciation of *p* and *b* is not as marked as it is in most European languages; normally indeed only one sound is used, intermediate between our *p* and *b*, but rather closer to the former. The Roman Catholics used the symbol *p* to represent this sound, whereas the Protestants used sometimes *p* and sometimes *b*, though tending mainly to prefer the latter, which became customary in most government publications. Much the same occurred with a dental sound of the *t* type which is apt to be palatalized before the vowel *i*. This was sometimes written as *t*, but in recent times more often as *s* or *j*; thus the Tongan form of the English name George has appeared as Siao*s*i, Jiao*j*i and occasionally as Tiao*t*i. Here, it seems, the position has been complicated by a change in Tongan pronunciation itself, by which an original syllable *ti* came to be given a sound intermediate between *tchi* and *tsi*, and finally dropped its dental and emerged simply as *si*.

Efforts at clarification of the spelling were made, but traditional written forms were hard to abandon, and for a long time no uniformity was reached. Recently, however, new proposals by the educational authorities have received agreement, and the rules for the spelling of the Tongan language in all official publications and in all teaching in schools were published in the *Tonga Government Gazette*

of 31 March 1943. The symbols *ng*, *p* and *s* are now standard, and the glottal closure (glottal stop, represented by ') receives official recognition, its omission even before capital vowels being regarded as an error as serious as the omission of any other consonant would be. (The spelling of Tongan place-names and other Tongan words in this volume is in conformity with these rules.) It is not expected that the new system will be at once adopted by the mass of the people, especially older Tongans, nor that the earlier literature will always be reprinted in the new form. Hence the visitor to Tonga may still find variant spellings in use. Thus the name of the principal island, in addition to its new official form Tongatapu, may occur as Togatapu or Tongatapu; and a fairly commonplace name Pangai (meaning 'a meeting place') may be found also as Pagai, Bangai or Bagai.

The elements of Tongan grammar, like those of all Polynesian languages, are simple, and inflected forms of words are few. But while it is consequently fairly easy to acquire a rudimentary working knowledge of the language, the many idiomatic expressions and homophones (words of the same sound but different meaning) render mastery of it difficult. The position is complicated further by the use in pure or classical Tongan of different words and expressions when addressing or referring to persons of different social standing. For instance, the head of a chief of the highest rank is *langi*, that of a chief of medium rank is *fofonga*, while that of an ordinary person is *ulu*; the word 'to go' when used of a high chief is *haele*, but is *mea* for a chief of medium rank and *alu* for a commoner. There is a growing tendency nowadays for these distinctions to break down, and ordinary villagers are apt to use among themselves the words formerly reserved for the chiefs of medium status. But in formal gatherings, as at the Tongan Court, politeness demands that the correct speech be used.

Tongan is the ordinary language of everyday life, among nobles as well as the common people, and is the medium of instruction in all the primary schools. Literacy in it is almost complete. In addition a number of the younger people in the towns (and almost all government officials) read and write English, and some speak it perfectly.

The Tongan language is practically uniform for all the major islands of the group, and for the outlying island of Niuaotupapu. The people of Niuafo'ou, however, have in their speech a few dialectal peculiarities. The common Polynesian article *te*, which exists in modern Tongan only in composition, and in one or two proverbs, is freely used in Niuafo'ou, as also some forms of personal

pronouns not found in Tongan. There are also some phonetic differences in common words, as *'aliki* instead of the Tongan *'eiki*, chief; and *fenua* instead of the Tongan *fonua*, land or island.

CULTURE

Tongan culture of today has a strong individuality. It has incorporated many elements of European and American civilization such as typewriters, telephones, horses and carts, motor-cars, the cinema, representative parliamentary government and Christianity. But at the same time it has preserved many elements of the traditional social system and is proud of them. The people as a whole and especially their leaders are very community-conscious, and national feeling is strong. Foreigners are appreciated for their technical skill and their help in coping with the complex demands of the modern world, but they are regarded as advisers and instructors rather than as controllers of the Tongan people. The Tongans realize that they are not yet ready to become independent of this external assistance, but their attitude may be summarized in the feeling of 'Tonga for the Tongans'. They do not look upon themselves as being 'natives' subservient to the white man, and they take great pride in the fact that alone among the Pacific peoples they have managed to maintain a separate state with a large degree of political freedom. Naturally this attitude is most marked among the urban Tongans, especially those of Nuku'alofa, and among those who have received higher education. But it exists to no small degree also even among the rural people of the more remote areas. It is impossible to understand Tonga without bearing all this in mind.

Village Life

In former times the Tongan people lived not in towns or villages, but in houses dispersed among their plantations, with many lanes giving easy communication. About the beginning of the nineteenth century, however, the breakdown of central authority and the internecine wars forced the people to cluster together for much of the time in fortified villages, known as *kolo*. With the final pacification of the islands in 1852, the last of these lost its fortress character, but the habit of concentrated settlement persisted, aided by the religious enthusiasm which centred on the local church, and by the canalization of much of the economic life through the copra trade. The modern rural Tongans live in villages (still called *kolo*), most of which have several hundred inhabitants each.

A plan of a fairly typical Tongan village, that of Pangai in the island of Pangaimotu in the district of Vava'u, is given in Fig. 18. This village, which lies about two hours' walk away from Neiafu, the capital of Vava'u, is a relatively self-contained social and economic unit. The villagers visit Neiafu frequently, especially on the half-dozen occasions in the year when vessels call there to load bananas and copra, and send a few of their youths to school in Nuku'alofa, but otherwise rarely have personal contacts with the outside world.



Fig. 18. Sketch plan of Pangai, a Tongan village.

The plan shows distribution of European-style and Tongan-style houses; the former are usually built when they can be afforded. Each of the four religious sects in the village has its own church. No scale is available, but the main street (running horizontally across the plan) is several hundred yards long. The rectangles indicate approximate town lots. Based on E. and P. Beaglehole, 'Pangai Village in Tonga', *Memoirs of the Polynesian Society*, vol. xviii, p. 9 (Wellington, 1941).

They live by cultivating their plantations and by fishing, paying the usual tax rental to the government for the use of their lands, which in this case form part of the royal estate of Pangaimotu island. There is no chief or noble living in the village, and general supervision over the lands of the estate is exercised by a resident overseer, who gives leadership in agriculture and acts as a kind of government representative.

The village, which has about 250 inhabitants, comprises about

forty rectangular house-plots, the whole covering an area of about 20 acres. It is intersected by two main roads, of which one arm leads down to the beach close by, and the others give access to the plantations and to neighbouring villages. These roads are 20 ft. wide, but are grass-grown for the most part, with a narrow track down the middle carrying foot or horse traffic, and are thick in mud during the rainy season.

The plan shows also the distribution of types of house. The Tongan dwelling of traditional style is built of wooden posts, with thatch and wall screens of coconut leaf, the whole secured with coconut sennit instead of nails. Such houses are cool and comparatively easy to build. They are also fairly cheap, though even for a small house at least 6,000 ft. of sennit is necessary, and if the work is to be done well, the services of an expert builder are engaged at a fee varying from £2 to £6 or more. These houses are of elliptical plan, with rounded apsidal ends, but the builder's fee is calculated according to whether the rectangular central portion of the house is 1 fathom, 2 fathoms or more in length. But even in these rural areas there is a preference for rectangular houses of a European type, with walls of sawn timber and roofs of corrugated iron. These houses are more costly to build and less cool to live in, but they have the advantage of being freer from insects and more resistant to gales. Moreover, they have the prestige of modernity. From the point of view of economic resources and social values, then, it is interesting to observe that in this village, typical of many others in Tonga, about 70 per cent. of the houses are in the Tongan style and the minority in European style. Throughout Tonga, however, there is some hybridism in construction; according to taste and means a householder will retain the Tongan shape but use iron instead of coconut leaf matting for roofing, or substitute boards for wall screens at the sides and rounded ends. Nearly every dwelling house has its separate cooking house (of Tongan form and materials) close by, and meals are taken either there or in the open air.

The village is served for water by concrete cisterns, on the average one to every three or four dwellings; rain water is collected in them from the houses with iron roofs. Most of the house plots also have a latrine, of the type introduced to lessen the incidence of hookworm and other tropical diseases.

The village is well endowed with churches, there being four of these buildings, each serving a separate sect. The Roman Catholics and the members of the Free Wesleyan Church of Tonga (the largest

of the three Wesleyan sects) have each a church building in European style; the others have buildings in Tongan style.

This description gives some idea of conditions of living in rural areas. In the few towns there are many more dwellings and government buildings of European construction, and in the whole kingdom approximately half the houses are now of wood, with iron roofs.

Social Organization

The Tongan people still govern their community life by many of the principles of their traditional social organization. The individual family of parents and children is the basis of family life, but children of kinsfolk often also share the dwelling, and a form of temporary adoption of children is frequent. The most common size of household is five to six persons, but households of ten persons and more are found. In general, a woman goes to live in her husband's house at marriage.

Tongan society lays great stress on kinship duties, and on the forms of respect towards kinsfolk. The basis of the system lies in the relations between brother and sister, but the wide use of these terms for people whom we would class as cousins introduces many complications. Those whom the Tongans class as brother and sister may not sleep in the same house, drink from the same coconut, or eat from the same helping of food, nor must they gossip about each other or quarrel. Formerly they might not sit together or talk to each other at close range, and the sister had to avoid her brother's house altogether. Nowadays these last rules are relaxed to some extent. To a less degree the same 'avoidances' must be practised between sisters-in-law.

In many social affairs, one who is called 'sister' is regarded as being of higher rank than her brother. These attitudes of respect are perpetuated in the next generation, when the people concerned marry and have children. The sister, as paternal aunt to the children, receives from them many marks of deference, including an extra large share of food when they hold a feast. By virtue of her influence and authority over her brother, she holds a very real control over the lives of her nephews and nieces. Conversely, the brother, as maternal uncle to her children, is expected to help them in many ways, as by hospitality and gifts of food, clothing and money. In this role, he is termed by the Tongans 'male mother'. His sister's children stand towards him in what is termed the *fahu* relationship. (In Fiji the similar relationship is known as *vasu*: see p. 153.) They have full

liberty to help themselves to his property—to go, for instance, to his gardens and take whatever bananas, yams or taro they require without asking permission. These relationships, important for commoners because of their economic aspect, are still more so for the families of chiefs, and for royalty, because of the authority and respect that they bring in their train. Thus in ancient times, the Tu'i Tonga, the supreme ruler, commonly took as the royal wife, to be the mother of his successor, the daughter of the Tu'i Ha'a Takalaua or (later) of the Tu'i Kanokupolu, the executive ruler. This meant that each Tu'i Tonga in turn was *fahu* to each Tu'i Ha'a Takalaua or Tu'i Kanokupolu. As such, he was entitled by all the rules of kinship to respect, to assistance, and to all the privileges which a maternal nephew's position gives. The Tu'i Tonga in turn, however, had to pay respect to his own eldest sister, and to her children, in particular to her eldest daughter. From the seventeenth century onwards the eldest sister of the Tu'i Tonga was known as the Female Tu'i Tonga, and was of higher rank than her brother. Normally, she was married to one of two high chiefs of Fijian descent, either the Tu'i Lakepa, or the Tu'i Ha'a Teiho. And in turn her son, succeeding to his father's title, might marry the next Female Tu'i Tonga, so perpetuating a system in which the members of only one or at most two families had privileges over the Tu'i Tonga. The eldest daughter of the Female Tu'i Tonga was known as the Tamaha. She was the person of highest rank in all Tonga, the great *fahu* of the Tu'i Tonga himself. To her he made obeisance, just as the rest of Tonga did to him. By a loose usage, all the children of the Female Tu'i Tonga were called Tamaha, but as a specific title the term was applied only to the eldest daughter after appointment to the position. But the rank carried with it one prohibition—the Tamaha was not allowed to marry. Lovers she might have, but any children she bore were illegitimate, and had comparatively low rank. This convention was very useful to the Tu'i Tonga and limited the range of persons to whom he was bound to pay respect by the rules of kinship.

This very brief account shows how the Tongan kinship system is part of the fabric of the social structure, and how in former times it reinforced the political organization. Nowadays, with the absorption of the titles of Tu'i Tonga into the royal family, and the abolition of that of Tu'i Ha'a Takalaua, the political situation has changed. But it is of significance for the loyalty of the Tongan people to their Sovereign that Queen Salote is not only of the Tu'i Kanokupolu line, but also is a descendant of Lavinia Veiongo, who would have

been Female Tu'i Tonga if the title had continued; and that the Crown Prince through his father is the direct representative of the old Tu'i Ha'a Takalaua line as well. Moreover, the Royal House now includes in addition the line of the Tu'i Pelehake, whose first ancestor was a celestial half-brother of the first Tu'i Tonga, and whose title has always been held in the highest respect.

The Tongan social system still pays great attention to rank. There are many gradations, but broadly speaking three major classes are recognized: chiefs (*eiki*) and members of their families; titled men with ceremonial functions (*matapule*) and members of their families; and commoners (*tua*). The chiefs in general trace their descent either from offshoots of the Tu'i Tonga and allied lines, or from noted immigrants from Fiji and other island groups. All can claim relationship to the first Tu'i Tonga. Among the members of any chiefly family only one person can hold the actual title at a time. The appointment, which is at the discretion of the Sovereign, is made usually in virtue of seniority of descent. In olden times chiefs had many privileges, varying according to rank, and they still receive tokens of respect from their inferiors. The offspring of a chief and a commoner are spoken of as 'half-shell'; they do not succeed to chiefly titles as a rule, but enjoy special consideration. The *matapule* are, properly speaking, men who are not of chiefly family, but who hold ancestral titles as ceremonial attendants to chiefs. There is very considerable range in their power and influence, which depend largely upon the rank of the chief whom it is their traditional function to serve. They act primarily for the kava ceremony, at which on formal occasions they are indispensable. Even a chief of high rank may present kava to the Sovereign at such times only through the medium of a *matapule*. Their appointment, like that of chiefs, is an official matter, though in the same way the senior representative of a family is usually chosen to hold the title. One of the functions of certain *matapule* is that of being official navigators to the Tu'i Kanokupolu and (in former times) to the Tu'i Tonga.

The status of chiefs and *matapule* has been affected to some extent by modern developments. In theory, the *matapule* of highest rank are inferior to the lowest titled chiefs, but the inclusion of several of them in the class of nobles—*nopele*, created by George Tupou I, and endowed with hereditary lands—has given these *matapule* a position superior to that of many chiefs who are without such lands.

Commoners in ancient times were the feudal retainers of the chief upon whose lands they lived, and in many cases were able to trace

their kinship with him, as very junior members of the same ultimate stock. Nowadays, however, with the abolition of the feudal relationship, the pacification of the state, and the opportunities of personal advancement given by constitutional government and the new economic forces, the attachment of commoners to their chiefs has lessened considerably. On the one hand, many commoners are unaware of or uninterested in their kinship ties with men of rank. On the other hand, their clear-cut position in the social stratification is tending to disappear, and the description of individuals as 'commoners' is a breach of good manners. Nevertheless, the traditional bonds are often still strong.

Land Tenure

In ancient times all land was in theory the property of the Tu'i Tonga, who bestowed it upon the various chiefs, or confirmed their ancestral control over it, as each chief received his appointment as a title-holder. The chiefs in turn apportioned land to their *matapule* and the commoners under their protection. Normally a tract of land so granted remained in the possession of the family concerned, though a chief might dispossess a commoner or transfer him to another tract at any time. Under this feudal system each holder of land paid tribute to his superior.

The system of tenure introduced by Tupou I, with its modifications subsequently, is described in the section on land policy (pp. 72-4). This, however, meant a change in form rather than in substance, though it put the nobles in a position of advantage by securing to them hereditary rents, paid through the government.

Occupations

The majority of the Tongans live by agriculture, with secondary dependence upon fishing. Within the ordinary village there is a major division of labour on the basis of sex. The men do most of the cultivation of foodstuffs and prepare most of the copra, bring food and firewood into the village, tend the animals, build and thatch houses, construct canoes, and carry out all sea fishing and reef fishing with spear and net. The women help with cultivation at times, do most of the cooking, tend the house and the children, make bark cloth and coconut oil, plait fine mats, baskets, fans and wall screens, collect fish and shellfish from the reef, and prepare *kava* for the many drinking parties. This pattern, which makes up most of the daily routine, is fairly constant throughout the year, save that

Sundays are devoted to rest, sleep, church-going and kava parties. Much cultivation is done by groups of men in working parties. Such a team may work for a day in turn on the land of each member, being fed by him as his turn comes; or it may be organized by the owner of a piece of land to clear or plant for him, and be rewarded by a feast of vegetables, pork, fish and chicken. Working alone is not a common Tongan practice; the presence of companions gives a stimulus. Co-operative labour is also used in netting or trapping fish. On occasions as many as a thousand people assemble for a large fish-drive, under the direction of a body of experts.

Nearly every village has its specialists, craftworkers such as canoe builders and carpenters, or experts in fishing and in Tongan medicine. In former times the Tongans had several types of large sea-going craft, some of which were introduced from Fiji or built on Fijian lines. But nowadays the canoes made are numerous small dugouts used in inshore fishing and a few plank-built sea-going craft used exclusively in catching bonito. All are very similar to Samoan types, but in general are more roughly constructed (vol. II, p. 625).

Most of the specialists are men, but women also have their own crafts. The manufacture of bark cloth is important, since it is still largely used as bedding, and is necessary for presentation on many formal occasions such as a marriage, the naming of a child, or a reception to a person of rank. The work is frequently done by the women of a village in an organized group, while their menfolk prepare a communal meal. Such a group may make several hundred fathoms of the cloth in a day, and each household tries to keep always on hand a hundred fathoms or more, to meet the demands of ceremonial. The cloth is beaten out from the inner bark of the paper mulberry tree, and either coloured over patterned wooden blocks, or painted with free-hand designs. These blocks are laborious to use and expensive, costing from £3 to £5 new, according to the intricacy of the design. Consequently, painting is tending to oust them, just as aniline dyes in bright colours, bought at the store, are tending to supplant the traditional Tongan black and reddish brown vegetable dyes, which need more trouble to prepare.

Ceremonial and Social Gatherings

Ceremonial affairs, such as marriage and funerals and the reception of visitors, show a blend of Tongan and European elements. Marriage, for instance, involves not only a licence and a church ceremony in European style, but also the presentation of fine mats,

bark cloth, and clothing by each of the two families to the other, and the provision of large quantities of food as feasts to the many relatives assembled. These relatives may have assisted with gifts of mats, and must be later repaid in kind. Without the elaborate exchange of gifts, and the feasting, the marriage would not be regarded as properly solemnized. Tongan custom is followed also in the common practice of delaying consummation of the marriage for several nights out of consideration for the bride, and in the preparation of a special feast if proof of her virginity is obtained.

In all Tongan gatherings the drinking of kava is a basic feature. Kava is not only the national beverage, it is also the token of hospitality. On formal occasions it serves as the medium for an elaborate ceremonial, which expresses many subtle points of etiquette, and which is closely linked with the whole system of rank in the community. (Compare the kava ceremony of Samoa, vol. II, pp. 617-19.) Any visitor to Tonga should therefore be aware of its importance. There are many grades of kava party, from the informal gathering of friends or villagers, to the highly formal drinking on ceremonial occasions, culminating in the kava circle of the Tu'i Kanokupolu, the Sovereign.

In the villages, especially when men of rank are not present, kava drinking is primarily a social activity, giving an easy opportunity for discussion of current events and, in particular, allowing the young men to pay court to the kava-maker, who is often a girl of marriageable age. Such parties are held very frequently. The kava root, from a plant of the pepper family, is either obtained from a man's own stock, or more commonly bought from a store at about sixpence per pound. The root is crushed between stones by a man and placed in a large wooden bowl, which is a prized household possession, often obtained from Fiji. Water is then added, and the crushed material is saturated, squeezed and removed from the bowl with a strainer of coconut fibre by the kava-maker, who should be a woman. The drinkers sit in a semi-circle facing the kava bowl. When the drink is ready, the man on the left of the kava-maker calls out the names or titles of the people present in turn, and each is given a cup of the liquid. As his name is called, each man claps his hands together twice in acknowledgment; when he receives the cup, he is expected to swallow the draught without drawing breath. He then returns the cup by passing it back or, if he is expert, sends it spinning along the floor so that it comes to rest by the kava bowl. In general, men alone form the kava circle, though the women of

the household listen to the talk. The kava-maker does not drink, nor is she supposed to take part in the conversation.

As men of higher rank take part, the ceremonial of the kava circle becomes more strict. Particular attention is paid to the seating of the participants and to the order in which they are served. In many cases, indeed, these rules are already laid down by tradition. On important formal occasions the title-holder of highest rank presides, directly across the circle from the kava bowl, and with one or two exceptions no chief may sit in the circle without an attendant *matapule*. The kava-maker, on these occasions a man, follows a definite procedure according to ceremonial directions by the *matapule* on the right of the president. When the kava is ready it is served according to the rules of that particular circle; the order in which a chief gets his cup depends on who is the presiding chief. In the Tu'i Kanokupolu's kava circle, the first cup is usually taken to the *matapule* on the right of the president, the second cup to the *matapule* on the left, and the third cup to the Tu'i Kanokupolu. After this, the chiefs and the remaining *matapule* are served. In the kava circle of the Tu'i Tonga in former times he received the second cup. On state kava occasions certain chiefs have their place behind the kava bowl, not in the circle, either because of their special functions, or because they are near kinsfolk of the presiding chief. Other rules govern the way in which the kava cup must be handled, the procedure in regard to the seats of absent chiefs, when one may talk and smoke, and so on.

The kava liquid, which has a mildly astringent peppery flavour, is said to be narcotic to a small degree, though much must be consumed before its effects are felt. The Tongans believe that occasional kava drinking is good for the health, an idea which may spring from the fact that it is a mild diuretic. The drink is very popular for its own sake, and there are some cases of men who have become addicted to it as if it were a drug.

Religion

All the formal structure of the ancient Tongan religious system has now disappeared, and the people are enthusiastic Christians. The old religion involved belief in an unseen world, Pulumotu, controlled by the great deity Hikuleo, and in a large number of other deities with special functions and often attached to particular islands. Nowadays, these deities are referred to as *tevolo*, a Tongan rendering of the English word 'devil.' They manifested themselves

through priests or priestesses, and also often appeared in the form of birds, animals or fish. Even today occasional manifestations of this kind are announced, showing that belief in the ancient gods is not entirely dead. In addition, there is a widespread conviction that many illnesses are caused by the ghosts of the dead, either through malevolence or desire to keep contact with the living. A great deal of Tongan native medicine, which employs massage and herbal remedies, is concerned with warding off or expelling these ghosts from the body of the patient. This native medical treatment is forbidden by law, but is widely used in preference to European medicine for many complaints, since it caters for the psychological as well as for the physical elements involved.

The religious history of Tonga since the coming of Christianity has been complicated by sectarian differences and by the desire of a large section of the people to be free from external control in church affairs. Reference has already been made to this (p. 44). At the present time the majority of the people belong to the Free Wesleyan Church of Tonga, the body formed in 1924 under the influence of Queen Salote to unite the two Wesleyan sects.* The relative strength of the various sects, according to the census of 1938, is as follows (considering native Tongans only):

	Per Cent.
Free Wesleyan Church of Tonga	56.0
Free Church of Tonga	27.5
Roman Catholic	12.5
Latter Day Saints, Seventh Day Adventists, Church of England	4.0

Doctrinal differences between the Wesleyan sects are slight and vague. Competition between sects and faiths is keen, and Tongan villagers not infrequently change their church membership.

* Published accounts often differ in the names given for the various Wesleyan sects. A judgment given by Chief Justice Stronge (*Tonga Government Gazette*, no. 10, Nuku'alofa, 1927) describes the original church as the Australasian Wesleyan Methodist Church, that founded by King George Tupou I as the Wesleyan Free Church of Tonga, and that formed by Queen Salote to unite them as the Free Wesleyan Church of Tonga. King Tupou's church is generally known as the Free Church of Tonga, or simply the Free Church, while after 1924 the minority who still constituted its adherents were termed for a time the Continuing Free Church. Recent writers describe three groups of Wesleyans and speak of a dissident minority, the Church of Tonga, distinct from the Free Wesleyan Church of Tonga, and the Free Church of Tonga. No details for the Church of Tonga are given in the census of 1938.

Stone Monuments

In ancient times the Tongans used stone extensively in building house platforms, mounds for chiefs' resting places, mounds for pigeon snaring and grave mounds. Many of these structures still remain. In their construction masses of loose earth and gravel were usually supported by retaining walls of either natural or dressed stone. Basalt was used occasionally, but limestone, being more easily procurable, was much more common. The limestone ordinarily



Fig. 19. Ha'amonga 'a Maui, Tongatapu

This famous limestone trilithon has often been figured. Based on: (1) A. H. Wood, *History and Geography of Tonga*, p. 7 (Nuku'alofa, 1932); (2) W. C. McKern, *Bernice P. Bishop Museum Bulletin*, no. 60, pp. 63-6 (Honolulu, 1929); (3) other sources.

used (locally called 'sandstone') consists of a consolidated stratified lime sand, which was easily quarried and worked; the reef limestone sometimes used for the largest blocks was more difficult to extract. Large blocks of stone were often carried considerable distances over water. Stones were often roughly dressed but fitted with some care; no mortar was used in building.

Among the most impressive Tongan stone structures are the grave mounds of members of the Tu'i Tonga family. Throughout the group there are 45 of these family cemeteries, known as *langi*,

according to native records. In Tongatapu there are 37, while Ha'apai has 6 and Vava'u only 2. The majority of those in Tongatapu are near Mu'a (p. 52). The *langi* is normally a rectangular platform or succession of platforms of stepped pyramid type, with retaining walls of dressed stone, and one or more stone burial vaults near the flat top. Some of the largest are more than 100 ft. long on each side and about 10 ft. high.

Another notable stone monument is the trilithon known as Ha'amonga 'a Maui (or shortly, Ha'amonga), which stands near Kolonga, on Tongatapu. It consists of an arch of three huge rectangular blocks of non-stratified limestone, carefully squared, with the lintel fitting loosely into a square-cut mortise at the top of each upright (Fig. 19). The archway faces north-south. According to myth, the culture-hero Maui brought the trilithon on a pole on his shoulder from Uvea—hence its name, 'the carrying pole burden of Maui'. But a more plausible tradition states that it was built at the instance of the Tu'i Tonga Tu'itatui (possibly about A.D. 1200). Its purpose is not really known, but it may have been a gateway. Tradition holds that it was erected to symbolize the unity of the sons of the ruler.

(For Bibliographical Note see Chapter III.)

Chapter III

TONGA (*cont.*)

Government: Social Services: Economics: Ports: Communications: Tongatapu Group: Ha'apai Group: Vava'u Group: Northern Islands: Bibliographical Note

GOVERNMENT

Central Government

Under various treaties and agreements Great Britain has undertaken to protect Tonga against external attack; jurisdiction in major matters over non-Tongans is vested in the British Crown; and provision is made for the appointment of a resident British representative, with the title of Agent and Consul, to be the medium of communication between the British government and the Tongan government, and to exercise certain important local functions. These functions include advice to the Tongan government on external affairs; direction of finance (with a right of veto on expenditure); approval of the appointment of Europeans in the Tongan government service; and judicial powers in respect of British subjects and foreigners. The Agent and Consul is a member of the British colonial administrative service and is responsible to the High Commissioner for the Western Pacific. He is assisted by a European clerk, who is usually recruited locally.

Subject to these provisions, the internal administration of Tonga is in the hands of the Tongan government, which consists of the Sovereign (a constitutional monarch), the Privy Council, the Cabinet, and the Legislative Assembly (Parliament).

The Privy Council normally consists of the Sovereign (who acts as President), the Speaker of Parliament, the Premier, the Minister of Lands, the Minister of Police, the Governors of Vava'u and of Ha'apai, the Chief Justice and the Treasurer. Only the last two are Europeans. The members are appointed by the Sovereign. The Privy Council advises the Sovereign on affairs of state, and in intervals between Parliaments makes ordinances which become law if the following Parliament confirms them. The Privy Council also prepares the estimates and sends them to the Agent and Consul for his approval before they are submitted to Parliament.

The Cabinet consists of all members of the Privy Council except the Sovereign and the Speaker of Parliament, and its chairman is the

Premier. It is really a committee of Parliament charged especially with the control of government property and appointments to the public service; one of its duties is to decide terms on which leases of land may be granted.

The Legislative Assembly, commonly known as Parliament, consists of the Speaker and the members of the Cabinet, together with 7 members elected by the 33 nobles of the kingdom and 7 members elected by male taxpayers of 21 years of age and over. Three of these last representatives are elected by the people of Tongatapu, Niuatoputapu and Niuafu'ou; two by those of Ha'apai; and two by those of Vava'u. The seven nobles represent the nobles of these districts in the same proportion. Parliament meets each year about the end of June, the session lasting about a month. Each section of the House—ministers, nobles and representatives of the people—sits at a separate table, but discussion is common. Parliament receives reports from the various administrative departments, enacts laws, deals with the ordinances passed by the Privy Council and considers the estimates. Petitions may be presented to it through members, who may also propose motions themselves.

This political machinery, entirely foreign to Tongan ideas and practice when first introduced, and for a long time a somewhat formal imitation of British usage, now appears to function effectively and to be really representative of the wishes of the people.

Administration and Local Government

In the administrative system the work is divided among a number of departments. The Minister of Lands controls the lands and survey departments, the Minister of Police the police, gaols and traffic departments, while the Premier as the head of the government administers the departments of foreign affairs, medicine, public works and agriculture, the printing office, the government vessels and telegraphs and telephones. In this work he is assisted by, among others, a Chief Medical Officer, a Director of Agriculture and a Superintendent of Works. Education, formerly in charge of the Premier, is now controlled by a separate minister. The Chief Justice, in addition to his judicial functions, registers births, marriages and deaths. The Treasurer is responsible for the collection of taxes and the expenditure of public money, is Controller of Customs and of the Post Office, and is in charge of the Savings Bank.

In Ha'apai, Vava'u, Niuatoputapu and Niuafu'ou the central government is represented in each case by a governor. The appoint-

ment of the governor is made by the Sovereign, though there is in practice often a strong hereditary basis for succession to the title.

Local government in the villages is not highly developed. In most villages a chief, a noble or a resident overseer of a royal estate acts in some sort as agent of government. The *fono*, the public assembly, is still used as part of the machinery of local government, but it serves rather for imparting to the people the decisions of the executive than as a deliberative institution.

Law and Justice

The laws of Tonga, after some vicissitudes (p. 45), were re-codified in 1891 and have been published with various modifications in several editions since then. The judicial system is in many respects based on the British model, and trial by jury is provided for by the constitution in cases which come before the Supreme Court.

There are two jurisdictions in Tonga. Under the treaty of 1900, civil jurisdiction over British subjects and foreigners is exercised by the British Agent and Consul, as a Deputy Judicial Commissioner for the Western Pacific. In criminal matters British subjects and foreigners were, till November 1928, subject to the jurisdiction of the High Commissioner's court for offences other than those against Tongan laws relating to customs, taxes, public health and police. After this date, however, by an amendment of the treaty of 1900, the Tongan courts have had their jurisdiction extended over British subjects and foreigners to cover offences against the laws and regulations of Tonga other than crimes punishable by death or by imprisonment exceeding two years. A European Chief Magistrate was appointed in pursuance of this extended jurisdiction.

There are four courts in Tonga. The Police Magistrates' Courts try offences where the penalty is not more than £50 or imprisonment for two years (mostly breaches of traffic regulations, petty theft, failure to clean road frontages, etc.) and small civil cases such as for debt or non-payment of taxes. They act also as Courts of Inquiry in more serious cases. These courts sit every week at Nuku'alofa and the other chief centres, and appeal lies from them to the Supreme Court. The Supreme Court, over which the Chief Justice presides, tries the more serious cases, including actions for divorce. Appeal lies from the Supreme Court to the (Tongan) Privy Council, the final court of appeal, and in cases involving British subjects two European assessors are present. There is also a Land Court with its own judge, and appeal lies from his decisions to the Privy Council.

Serious cases involving Europeans are tried in the Commissioner's Court of the British Agent and Consul. The Tongan police, where called upon to do so, assist this court in making arrests and enforcing judgments.

Serious crime is very rare in Tonga, and the majority of cases before the Supreme Court concern charges of theft and fraud. Prisons are in charge of the Minister of Police. There is one main prison at Nuku'alofa, where all long-term offenders are confined, and there are also gaols at Ha'apai and Vava'u. According to a long-standing Tongan custom, prisoners are employed on road-making, preparation of copra, and tree-planting for the government, and on other public works. At an earlier period the convicts mostly lived at home, and their hardships were so light that several sets of regulations were introduced to make imprisonment a more effective punishment.

Land Policy

The Tongan land system is in some respects unique. George Tupou I, partly in assertion of his sovereignty and partly in resistance to pressure from Europeans desiring to acquire land, incorporated into the constitution of 1875 the provision that all the land of the kingdom belonged to the Crown and could not be alienated; only leases approved by the Cabinet could be recognized. But, subject to these provisions, the people were entitled to land for residence and cultivation. In actual fact much of the land of Tonga was held by the great chiefs. In 1882 the situation was regularized by the King, who granted large areas of land as hereditary estates to the nobles he created. He thus confirmed in most cases the great chiefs in their ancestral holdings, but added certain other non-chiefly title-holders to them as landowners. In 1894 the list of hereditary lands was increased by George Tupou II, and in 1919 the holders of the hereditary estates were again confirmed in them by Queen Salote.

In 1890, however, on the advice of Basil Thomson, the Crown was made responsible for the collection of rents, the granting of allotments and the eviction of tenants on these estates, thus reserving for itself the ultimate control over them.

Apart from these estates granted to the nobles, every male Tongan, on attaining the age of 16 years, that is on becoming a taxpayer, is entitled to a tax allotment of 8½ acres for cultivation and to a town site of 132 sq. yd. for residence. On his application to the Minister for Lands he is granted the allotment either out of the estate of the

noble on which he resides, or if no land is available there, out of government land elsewhere. For the cultivation allotment he pays annual rental of 8s., which is remitted to the noble or retained by the government according to the ownership of the land. No rent is paid for the town site. Provision is made for the ejection of the tenant for non-payment of rent or for failure to comply with the planting regulations, which stipulate that within one year of receiving his allotment he shall plant 200 coconut palms, spaced 30 ft. apart. In 1890 the poll tax was virtually converted into a land tax by making the land liable to forfeiture if the tax was not paid for three successive years.

Provided that the conditions are properly observed, every tenant is entitled to keep the grant of land made to him for his lifetime; his widow has a similar life interest, and at her death a son may choose to carry on the occupation of his father's holding, though in no case may a man occupy more than one allotment. The general effect of the system is thus to secure a permanent settlement of the people on the land, while reserving to the government all rights of alienation.

The interests of Europeans are not greatly encouraged, but they are provided for on a small scale. Areas up to several hundred acres are obtainable by them on lease at annual rentals of from 4s. to 10s. per acre, for periods not exceeding 50 years, with an option of renewal after that time at increased rentals.

Though the broad aims of the land system have been realized, its success has not been complete. In 1927, for instance, though by law the area of allotment was $8\frac{1}{2}$ acres, it had been exceeded in many cases. On the other hand, there were many Tongans who did not take advantage of their statutory right to land. There were several reasons for this. Some of them lived in the towns and pursued other occupations than agriculture; some lived on their father's cultivation allotment to which in time they hoped to succeed; and some appeared to be disinclined to leave the island where they were living, presumably on their relatives' land, to take up an area allotted them elsewhere. This failure to take up land has grown in recent years. In 1927 approximately 5,500 allotments were held, and only 700 taxpayers had not applied for allotments; in 1930 approximately 7,000 allotments were held (including 329 by widows) and 1,235 taxpayers had not applied; and in 1936 about 6,750 allotments were held (including 723 by widows) and 2,484 taxpayers had not applied. The reason is not a scarcity of land for the group as a whole. In 1930 it was estimated that if every taxpayer was an allotment holder

approximately one-half of the land of the kingdom would be still available for distribution. Local scarcity of land in the more favoured areas, however, does seem to be an operating factor. Various efforts have been made to remedy the situation. In 1927 provision was made to enable any male Tongan to receive on application, in lieu of other grants, an area of $12\frac{3}{8}$ acres of land in the bush for a rental of 4s. In this case he would not be eligible for a town site. It was hoped by enlarging the area and reducing the rent to induce people to live on the land rather than in the villages, and to relieve the congestion on some of the islands. By 1934, however, only 23 applications for these blocks had been received. In this year the scheme was enlarged still further. Provided the executive considered that sufficient land was available to meet ordinary tax allotment needs, the chiefs were enabled to grant an applicant in lieu of other lands an area of 15 acres on their estates, made up of a tax allotment of $8\frac{1}{4}$ acres, a town allotment of $1\frac{3}{4}$ acres and a leased area of 5 acres (for 50 years at a nominal rental). The object of this too was to induce Tongans to live on their farms. No information as to the success of this provision has yet been published.

Finance and Taxation

The Tongan financial year ends on 30 June. The general financial position is sound, there being normally some excess of revenue over expenditure; and there is no public debt. Surplus funds are considerable, amounting in 1937-8 to over £170,000 Tongan currency. Some funds are invested in government stock in Australia and New Zealand, and in Nigeria, Straits Settlements and other colonies; and some are held on fixed deposit, primarily in the Bank of New Zealand in Sydney. During the past decade revenue has averaged about £67,000 and expenditure about £65,000 per annum. In 1939-40, however, revenue was only £54,867, while expenditure had reached £69,687.

The main heads of revenue are customs duties, poll tax, rents and interest on government property and investment, port and wharfage payments, licence fees, court fees and fines, and post-office revenue. Customs duties, from which about one-third to one-half of the revenue is derived, include an export duty of £1 per ton on copra, and general import duties of $12\frac{1}{2}$ per cent. on goods of Empire origin and $33\frac{1}{3}$ per cent. on goods of foreign origin, *ad valorem*. A few Empire goods enter free, and the corresponding tariff for similar foreign goods is 20 per cent. This tariff, the result of a

revision in 1937-8, was designed to increase the margin of preference for goods of Empire origin and to reduce the duty on certain articles used mostly in agriculture. The poll tax, from which about one-fifth of the revenue is derived, is payable by every male Tongan of 16 years of age and over. Prior to 1937 it was at the rate of 36s. per annum, but it was then reduced to 32s. per annum. The tax is paid in quarterly instalments to the district tax clerk, by whom a register of taxpayers is kept and revised annually. Exemption from tax may be granted on account of old age or sickness.

The only bank in the kingdom is the Government Savings Bank, established in 1926. By 1930 annual deposits had reached a level of over £23,000, as against withdrawals of less than £15,000 for the year. The coming of the economic depression, however, led to a less favourable position, but in 1938 the total amount to the credit of depositors was approximately £20,000, and the bank had considerable invested funds. In this year there were 1,238 Tongan and 183 European depositors.

British and Australian coin was made the currency of Tonga by a statute passed by the Tongan Parliament in 1906. In 1919 the Tongan government issued its own notes, the issue being secured by an investment reserve, and in 1938 notes to the value of about £25,000 were in circulation. In 1934 it was made unlawful to import silver coin exceeding £2 in value into the kingdom except by special permission. The Tongan treasury had suffered heavily through the importation of Australian coin, which had been accepted at the same value as British coin, though at that time Australian currency was depreciated in relation to sterling on the world market. The Treasury Notes Act of Tonga in 1935 adopted an exchange standard system based on Australian currency.

SOCIAL SERVICES

Medical Services

The health of the Tongans is comparatively satisfactory for a Pacific islands community. The major diseases are filariasis, yaws and tuberculosis, and eye conditions such as conjunctivitis and trachoma. Malaria is absent, and leprosy is rare, though in 1927 thirteen lepers were transferred to the Makongai leper asylum in Fiji. The incidence of hookworm was formerly heavy, but has lessened greatly with the adoption of a system of cement latrines as part of a vigorous campaign conducted by the government with the

assistance of the Rockefeller Foundation. By about 1930 every village was thus equipped. Typhoid and dysentery have been prevalent in the past, especially at Ha'apai. Here as in practically all other places in Tonga the people depend for an unpolluted supply of drinking water on rain catchment, but in times of drought they often use well water for general domestic purposes. Concurrently with the campaign against hookworm the government combated these other diseases by repairing and enlarging the village concrete cisterns. In former times the Tongans had a religious objection to using the water from the roof of a church, but by 1930 this antipathy had disappeared, and the efforts of the government were thus made easier. These improvements in the water supply reduced the incidence of typhoid and dysentery considerably.

During the last decade antenatal clinics and infant welfare clinics have been established; free food for infants is supplied if required. All Tongans receive free medical attention, and dental treatment is also available. There are three hospitals, one each in 'Tongatapu, Ha'apai and Vava'u; Niuatoputapu and Niuafu'ou are each served by a dispensary. The Vaiola Hospital in 'Tongatapu is the main one in the kingdom, and is equipped with a fairly modern operating theatre. It is administered by the Chief Medical Officer, a European, with a European sister in charge, and five Tongan nurses, while a Tongan medical practitioner who is attached to it also visits outside patients. Niu'ui Hospital in Ha'apai and Ngu Hospital in Vava'u have also European and Tongan staff. The dispensaries are in charge of Tongan medical practitioners, of whom altogether there were 7 in the group in 1938.

Education

The early history of education in Tonga is closely associated with the activities of the Christian missions. The Wesleyans began educational work in 1826, and the Roman Catholics followed not many years later. But long before the close of the nineteenth century the government of Tonga, in advance of those of many Pacific islands territories, began to take an interest in establishing state schools. Statutes dealing with education were included in the various codes of law, and King George Tupou I, who had founded Tupou College as a Wesleyan institution in 1866, founded Tonga College—the government college—in 1882, making it a personal gift of a valuable site and endowing it with a large area of planting land.

In 1927 a comprehensive act was passed, dividing the schools into primary, middle and high schools. The primary schools are attended by all Tongan children between the ages of 6 and 14, education being compulsory for this period, and free. The missions and the government share this work. In 1940 there were 65 government schools and 52 denominational schools, with about 4,000 pupils in each group. Till 1930 the buildings of the government schools were provided and maintained by the taxpayers of each village, but since that date they have been a charge on general revenue. All these primary schools give elementary education in the vernacular, and at most of them boys and girls attend together. No middle schools had yet been established in 1940.

The high schools, which are residential, provide secondary education, with English as the medium. The principal high school is the government college at Nuku'alofa, with nearly 200 students in 1940. It is co-educational and is the main source from which the government obtains its clerks, teachers, medical practitioners and other public servants. An annual course of instruction for head teachers of the primary schools is given here during the long vacation, and evening classes in English are conducted for non-collegiates throughout the year. Tupou College, a Free Wesleyan Church school, provides mainly school teachers, who go into government service or to the mission schools. In 1921 the boys' section of this school was transferred to Nafualu, the girls' section remaining at Nuku'alofa. Api Fo'ou College, founded by the Roman Catholic mission in 1888, exists primarily to train selected boys to be teachers in their parochial schools. Secondary education for Roman Catholic girls is provided to some extent at the Nuku'alofa convent. Beulah College, conducted by the Seventh Day Adventist mission, was granted recognition as a college by the government at the end of 1937; and Makekeke College, conducted by the Latter Day Saints (Mormon) mission, was granted recognition at the end of 1940. Both are co-educational.

The staff of all these colleges comprises both English and Tongan teachers, and the principal of the government college is also the Director of Education for Tonga. Instruction is given in the ordinary academic subjects, but in addition carpentry is taught at the government college, and in all cases the native foods consumed are grown on the college plantations by the boys under the superintendence of their teachers. The policy of the administration has developed in the direction of giving an agricultural bias to boys' education and a domestic science bias to that of the girls, and a greater

interest is now being shown in Tongan arts and crafts. In this way it is hoped to fit the young people for the life which the majority of them will take up. Since 1924 apprentices in agriculture have been employed at the agricultural station, where they are taught about plant diseases, etc., and instructed in improved methods of cultivating native foods. In 1927 a scholarship scheme was instituted to allow Tongan students from the college to go abroad for secondary and university education, and a number of students have continued their work in Australia under these auspices. Young men are also sent to the Central Medical School at Suva, Fiji, to receive training as Tongan medical practitioners.

ECONOMICS

With the exception of fisheries, which are important for the domestic food supply, but which play no part in external trade, the resources of Tonga are entirely agricultural. Hunga Tonga and Hunga Ha'apai, north-west of Tongatapu, are reported to contain deposits of phosphate, but have no anchorage, and apparently would not repay the trouble of working. In the latter part of the nineteenth century some coconut oil was extracted, and a figure of 100 tons, valued at £7,000, has been given as the annual export, but this process has long been abandoned on a commercial scale. There are no secondary industries which serve an export market.

Agriculture

One of the main occupations of the Tongan people is growing vegetables for home consumption, the chief being yams, taro, tapioca, sweet potatoes and plantains. The approximate area under these crops is difficult to determine, but in 1931 it was estimated that the root crops alone occupied about 8,000 acres. The census gives exact figures of the number of plants of yams, tapioca, sweet potato, etc., each year, but the results must be subject to a considerable margin of error. However, they give some idea of relative production in the three major groups. Out of a total of nearly 3 million yam plants in 1938 Tongatapu grew more than two-fifths, Vava'u one-third and Ha'apai less than one-fifth. Of sweet potatoes, totalling over 1½ million plants, Tongatapu was again the greatest producer, with nearly three-fifths, while Ha'apai grew about a quarter and Vava'u little more than one-tenth. With tapioca, however, Ha'apai is the heaviest grower, having a large majority of the

800,000 plants. This difference is probably due to the drier, more sandy soil of Ha'apai.

Other agricultural products of importance are coconuts, bananas and pineapples. The coconut is an important article of native diet, and it has been estimated that about 20 per cent. of the coconut crop is consumed locally. According to the census of 1938, there were nearly 3,250,000 palms in the kingdom, about one-third of them in Tongatapu, with Vava'u and Ha'apai each having about one-quarter. Only a very small proportion of the palms—about $2\frac{1}{2}$ per cent.—are owned by Europeans and other non-Tongans. The chief product from the coconut is copra, which is the mainstay of the Tongan export trade, and its maintenance is supported by the requirement that every holder of a tax allotment should plant coconut palms. The production of copra is affected not only by hurricane and drought, but also by fluctuations in international prices, and by shipping difficulties in times of world disturbance. In 1914 the trade suffered through interruption of shipping due to strikes in Australia and New Zealand; and in 1917 there was complaint of poor copra prices owing to high middlemen's profits, and nationalization of copra dealing was proposed by the Premier; in 1919 steamer carriage was again difficult; in 1921 there was a heavy fall in price after the boom conditions of the war; in the latter part of 1926 and in 1927 copra production was affected adversely by the 1925-6 drought; in 1930 there was another slump in the copra market, accentuated in Tongatapu and Ha'apai by a prolonged drought, and these conditions continued in the following year. Finally, after a recovery during the past few years, the scarcity of shipping during the present war has given the industry a further setback. In addition to these troubles, Tongan copra production was also threatened for some years by the rhinoceros beetle, a dreaded pest which attacks the palms. This was discovered on Niuatoputapu in 1922, but was eradicated before it had time to spread, though not finally until 1929.

The export of copra over a period of years has averaged about 10,000 tons per annum (Fig. 20). The quality is not very high, and a Copra Act of 1926 made it a statutory offence for a trader to have bad or damaged copra in his possession. Government efforts at improvement by the introduction in 1937 of kiln driers of the Malayan type have not proved very successful, despite their cheapness, partly because of the low price of copra in 1938. The copra is sold to traders and merchants in individual transactions; there are no native-co-operative societies which take part in the marketing. The reasons

for rapid fluctuations in world prices of the product, naturally enough, are hardly grasped by the Tongan peasant, and a sudden fall in price is apt to react severely upon production. The slump of 1921, for instance, caused many Tongans on Niuaf'ou to refuse to prepare copra—they said they would rather feed the coconut meat to their pigs and grow pork to eat than buy the white man's tinned goods—suspecting that somehow the markets were being rigged against them.

This brief account shows the danger to the economic welfare of the country of relying upon copra as the sole exportable commodity. The government has therefore tried for long to encourage other

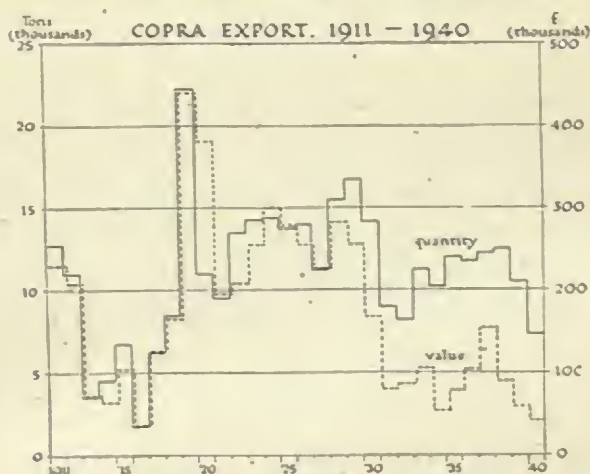


Fig. 20. Export of copra from Tonga, 1911-40

Based on: (1) *Colonial Office Annual Report for 1923-38* (London); (2) *Premier's Annual Report for 1914-40* (Nuku'alofa).

types of production which would act as a cushion in bad times. In 1931 cocoa and cotton were introduced experimentally; in 1940 the low prices of copra stimulated trial shipments of bark cloth to the United Kingdom and the United States and of ground-nuts to New Zealand. Sweet potatoes and pineapples have also been exported to New Zealand in small quantities for a number of years.

But interest in finding a secondary product to copra has centred mainly on bananas, for the cultivation of which Tonga is well suited. In the first decade of this century the export of fruit, principally bananas, to New Zealand, was an important item. In 1908, for example, the fruit export was over 100,000 cases, valued at £14,000.

In 1909, however, restrictions were put by New Zealand upon this trade, which then began to decrease, though regular shipments continued until the last war, when lack of communication killed it. Attempts to revive it on several occasions failed. In 1914 the Gros Michel variety of bananas was introduced to cater for the foreign market. But the Tongan does not use the commercial banana to any great extent as food, and any production over market requirements tends to be used by him for feeding stuff for his pigs. The lack of direct steamer communication with New Zealand and the difficulty of obtaining regular supplies of bananas from the native growers reacted upon each other, and apart from a small export in 1923 the trade remained negligible until 1931. Satisfactory transport arrangements were then made by the government. A considerable export

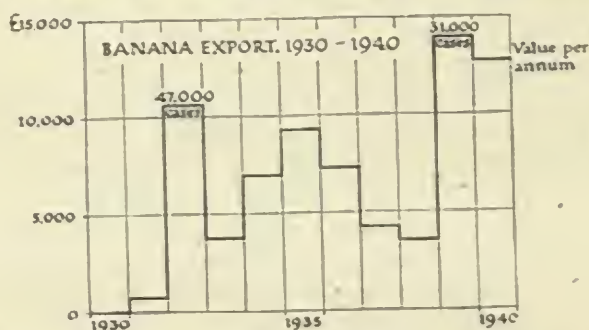


Fig. 21. Export of bananas from Tonga, 1930-40

The weight of a case is about 40 lb. Based on: (1) *Colonial Office Annual Report for 1930-8* (London); (2) *Premier's Annual Report for 1931-40* (Nuku'alofa).

immediately sprang up, limited only by occasional adverse weather conditions and by the New Zealand quota system. By the end of the year approximately 1,600 acres had been planted in bananas. In 1932 arrangements were made with the New Zealand government whereby a combined quota was allotted by the Dominion to Fiji and Tonga of 12,000 cases a month from May to September and 15,000 cases a month for the rest of the year, the Tongan share being 20 per cent. of the total. The amount of the quota varied somewhat in subsequent years in accordance with the New Zealand demand, the Tongan export sometimes falling below its allotted share owing to hurricane or drought, and sometimes exceeding it owing to shortages elsewhere. In 1939 and 1940 the average export was about 30,000 cases of a value of about £13,000 (Fig. 21). Europeans play

only a very small part in the trade, although in 1940 the European shipment averaged 52 cases per head as against the Tongan average of 13 cases.

Other forms of agricultural production include the growing of tobacco and of kava in small quantities for domestic use and sale, a little vegetable growing for sale to Europeans, and in particular the rearing of livestock. In 1939 Tongans alone owned 5,000 horses, 900 cattle, 5,000 goats, 20,000 pigs and 57,000 fowls and ducks. The keeping of cattle by Tongans is a habit of modern growth, but pigs have long been regarded as an essential part of the economy. Nearly every household has several, and they are used not so much for ordinary food as for feasts at times of birth, marriage and death, or the visit of relatives. As a rule the pigs are not sold.

In 1940 the policy of the government in the economic field was integrated and expanded by the Agricultural Organization Act. This provided for the organization of producers into groups to be known as Local Producers' Associations, each electing a committee annually to see to the proper cultivation of the land. Such associations, it was hoped, might form the basis of co-operative societies. A Council of Agriculture was also set up to advise the Minister of Agriculture, and an agricultural and industrial development fund was established. The aims of this policy were to encourage the people in the adequate planting of food and cash crops, to control the marketing of export products and their quality, to seek new markets, and in general to develop agriculture and industry.

Land Tenure

Tonga is essentially a country of peasant producers. Europeans' interests in land are small, and there are only a few European planters. Though leases of small amounts of land can be had, in 1933 the 1,634 European leases comprised only 7,422 acres, mostly in the form of residential lots, store sites and trading stations; there does not seem to have been much change since then.

The general system of land tenure has already been described on its legal and administrative side (pp. 72-4). All the lands in the kingdom are in the last resort the property of the Crown, but from the standpoint of tenancy they are of three main types.

(a) *Tofia*, the large estates of the government, the Royal House (the Queen) and the nobles. The distribution of these estates on Tongatapu is shown in Fig. 22, and a somewhat similar situation obtains for the other major areas of the kingdom. Of the 39 estates

into which Vava'u is divided, 17 are government property, 16 belong to nobles and 6 are royal estates. In recent years the island of Nomuka and some other lands have been granted as estates to the Crown Prince. In Fig. 22 the estates of Tungi have been shown separately, since, while strictly speaking his family belongs to the hereditary nobility, by his marriage to the Queen his lands in effect have passed into the control of the Royal Family.

(b) *Api kolo*, village or town lots on which dwellings are erected. Each male taxpayer is entitled to one of these for himself and his family.

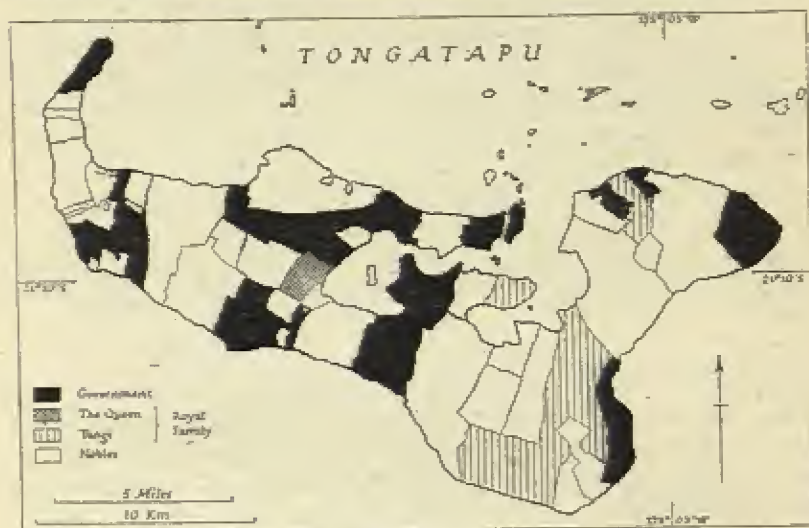


Fig. 22. Estates in Tongatapu.

Reefs are omitted, and land classification of the small islands off the north coast is not given. Boundaries of estates are approximate. Since the death of Tungi (in 1941) his estates have passed to the Crown Prince Tupouto'a; they were administered for him by the Queen for a time. Based on: (1) E. W. Gifford, *Bernice P. Bishop Museum Bulletin*, no. 61, p. 173 (Honolulu, 1929); (2) A. H. Wood, *History and Geography of Tonga*, pp. 95-9 (Nuku'alofa, 1932).

(c) *Api 'uta*, termed more briefly *api*, the sections of the large estates held on grant or lease by individual taxpayers for purposes of cultivation. A man is entitled to a personal grant of only one *api*, but some men hold more by lease or inheritance.

The policy of the government is to make available to every Tongan man an area of land adequate to support him and his family, and to allow scope for individual enterprise by giving facilities for obtaining extra land by lease. This aim has been largely achieved. But the pull of the towns, the inequalities of inheritance, the attachment of people

to places where they have been brought up, and differences in the concentration of population, have led to some unevenness in actual land holding. Thus in a sample case of Pangai, the small village near Vava'u described earlier (p. 57), 36 men each hold an *api* of small size, about 8 acres; 6 men each hold a large *api*, about 16-20 acres; 3 men hold or control 2 *api* each; and 1 man controls 3 *api*. In this area all available land for cultivation has been taken up, so that young men as they reach maturity will either have to arrange to share the produce from an *api* controlled by a kinsman or will have to seek land away from their home village. Non-resident tenancy also occurs. Of about 80 *api* surrounding the village only about 50 are controlled by present residents, and the remainder are held by people living in other villages, mainly on Vava'u. These non-residents all continue to pay rent on these lands, either having been at one time residents of Pangai or having inherited the land from kinsfolk there. Most of them cultivate the land for food or prepare copra from the coconut palms there. With more intensive cultivation it is probable that the number of persons supported by an *api* could be increased, though this might mean a diminution in the income from copra.

Labour

The number of people employed on wage labour in Tonga is very small, and consists mainly of men from the Solomon islands, Niue and Fiji, working on plantations or in the stores. They receive a wage of about £5 a month, with food. A few Tongan men take up casual employment as stevedores or store-workers at a wage of about 8s. a day. They do not engage in domestic service, but Tongan girls do, at a wage of £2 10s. to £3 a month. Alien labour, apart from that of the other Pacific islanders needed, is not encouraged, and the Undesirable Immigrants Act tends to restrict the coming of aliens by providing for a deposit of £50 on request.

Income and Indebtedness

The general average of Tongan income per head is low by European standards. The cash income of the head of a family through the sale of copra and bananas is probably in the region of £10 per annum on the average, though some men supplement this by the sale of tobacco and garden produce and by occasional paid employment. The cash received from all these sources goes to buy clothing, kerosine, soap, matches, tobacco and some tinned meat, flour and sugar; and to pay rent, tax and church contributions.

Rural indebtedness is not a serious problem. Lack of security tends to lead to purchase of store foods in cash, and where credit is given it seems to bear fairly lightly on the Tongan debtor. An index to this is given by the fact that on one occasion £1,000 worth of book debts of a Neiafu store which closed down fetched only £5 at auction, after an opening bid of 5s. Mortgaging of growing crops is forbidden by law, and there is, therefore, no system of crop liens (as obtains in Fiji) by which the cultivator may fall into the hands of the trader or money-lender.

Trade

The external trade of Tonga depends primarily on the export of copra and to a less extent on that of bananas; as the prices for these change so does the volume of imports tend to fluctuate. In recent years copra and bananas together have represented about 98 per cent. of the total export. The total trade of the country is small, the average value per head being only about £5 in 1938. The majority of the trade takes place with the British Empire. Bananas go to New Zealand and some of the copra to Great Britain and Australia, though before the war much of it went to unspecified European countries. Of imports, Australia and New Zealand supply about one-quarter each, in the form of flour, tinned meats and tobacco; Great Britain supplies hardware, machinery and cloth, representing on the average about 15 per cent. of the total imports. The United States supplies mainly oil; Fiji, sugar; and India the gunny bags in which the copra is packed. Before the war Japan supplied a quantity of cheap drapery, and her share of the imports had been rising—from about $7\frac{1}{2}$ per cent. in 1932 to almost double this in 1937—though it fell again in 1938. Most of the trade is handled by branches of large European firms with headquarters in Sydney or in Suva, though there are some local European traders.

Internal trade is confined mainly to the buying of copra from the Tongan producers and the sale of imported goods to them. The prime agency for this is the village store or trading station, under the control of a European manager in the larger centres, and of a Tongan or 'half-caste' in the smaller ones. There were also formerly some Japanese storekeepers. Complaint has been made that Tonga is over-supplied with stores, every village having at least one, and sometimes two or three. There is keen competition among traders for copra, but overhead charges are high, reacting on prices.

PORTS

The ports of entry in Tonga are Nuku'alofa and Neiafu. Lifuka is the only other port of any interest.

NUKU'ALOFA

Nuku'alofa, on the north side of Tongatapu, is the chief port of the group (Fig. 23).

Approaches

The approaches to Nuku'alofa are complicated, since coral reefs and shoals extend for some distance from the shore and numerous coral islets are dotted about on them. There are three channels by which anchorage may be reached: Ava Lahi (Great Passage), Piha passage and Egeria channel. Piha passage is the only one recommended for vessels of more than 22 ft. draught, but Egeria channel is much less difficult for vessels of lighter draught than this. Ava Lahi is not safe for any but vessels of light draught.

Ava Lahi passage is entered from the northward and proceeds south-east and then south-west, with many coral heads in or near the channel. Egeria channel lies north-east of the north-west tip of Tongatapu, and leads out of Maria bay. It is short and the tidal stream sets fairly through, but it is narrow and has a least depth of only 30 ft. in parts. It is especially useful for vessels up to 22 ft. draught approaching from the west. Piha passage is entered from the east. The channel between 'Eua island and Tongatapu which leads up to it is wide and deep, and the passage itself is about 7 miles long, with a width of rather more than $2\frac{1}{2}$ miles at the eastern end near 'Euaiki, but narrowing in, with coral reefs on either hand, as it proceeds. Finally a sharp turn is made out of the passage, to the north-west, through the Narrows to the east of Makaha'a island; here the tidal stream runs strongly and may be irregular. Nuku'alofa harbour then lies to the west.

Anchorage

Nuku'alofa harbour lies on the north side of Tongatapu; it is of moderate depth and is free of dangers, the few reefs being clearly visible. Anchorage for large vessels is obtained to the south and east of the western reef in 12-14 fathoms, on a bottom of coral patches with coral and sand between them. Between November and April

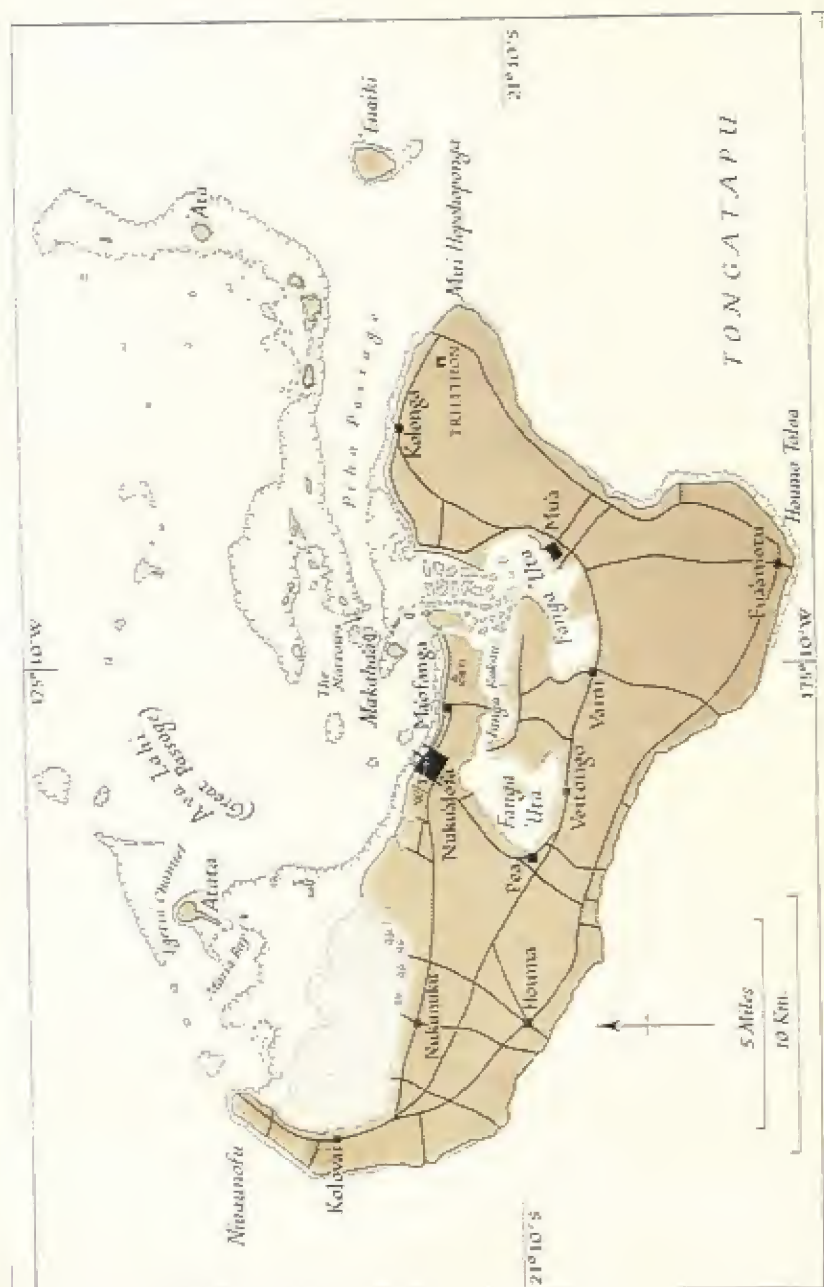


Fig. 23. Tongatapu: roads and principal settlements

Based on: (1) Admiralty chart no. 2367; (2) A. H. Wood, *History and Geography of Tonga*, p. 78 (Nuku'alofa, 1932).

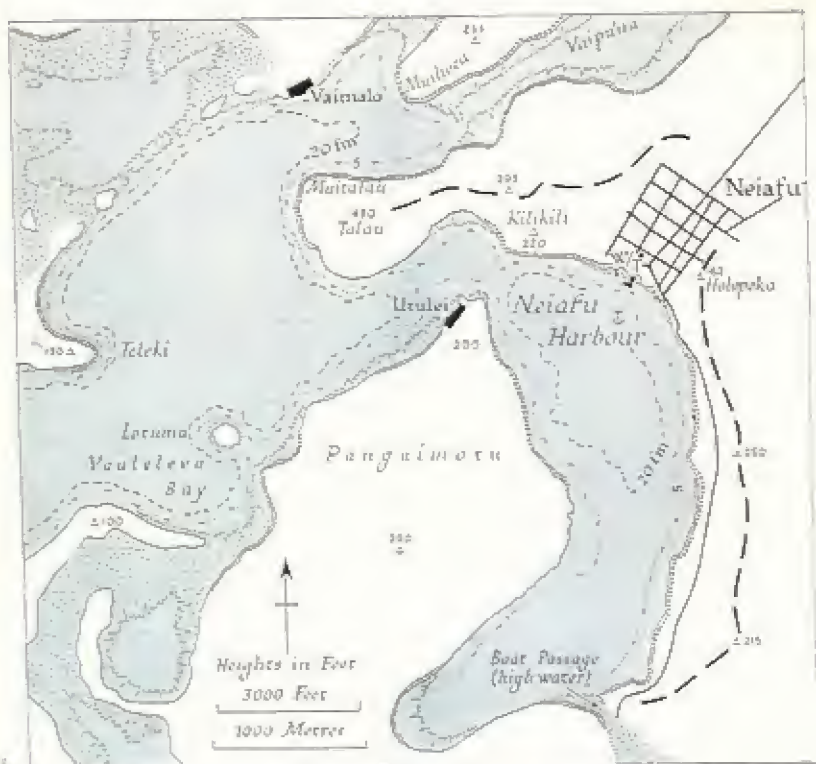


Fig. 24. Neiafu harbour, Vava'u

The layout of the town is shown in the main street plan; more recent road extensions are probable. Based on Admiralty chart no. 3097.

more shelter and better holding ground are to be had in the eastern bight of the harbour.

Port

A causeway of coral blocks has been built out to the end of the reef in front of the government buildings, and at the end of it is a T-shaped jetty built of concrete faced with wooden piles. The berth is 200 ft. long, with accommodation for vessels of 22 ft. draught. For vessels exceeding 200 ft. in length anchors have been embedded in the reef and facilities given for securing mooring wires. A tramway runs down the jetty, and there are landing steps for small boats at the outer end on the western side. Government sheds stand at the inshore end of the causeway.

Facilities include three towing launches and six lighters. Neither coal nor fuel oil is obtainable, but drinking water may be had from a pipe on the jetty. Beef and bread are plentiful; other provisions may be obtained, though vegetables are apt to be scarce. There is a W/T station at Nuku'alofa, and a quarantine station on Makaha'a island.

LIFUKA

Lifuka is the only port of consequence in the Ha'apai group, and lies about 100 miles from Nuku'alofa, on the western side of Lifuka island (Fig. 26):

Approach

The numerous reefs and shoals within the 10-fathom line render navigation difficult, and despite guidance given by buoys and beacons it is often not easy to distinguish the reefs at high tide on a smooth day. The outer anchorages, beyond the 10-fathom line, are approached fairly directly from the west. The inner anchorage is best approached either by the Ava Muikuku channel from the north or the Ava Tupu channel from the west. The Ava Muikuku, south of Hakau Muikuku reef off the north-west of the island, has depths of not less than 22 ft., and is the channel ordinarily used. The Ava Tupu, about 400 yd. wide in the narrowest part, has a depth of 27 ft. A southern approach to the inner anchorage is given by the Ava Lima Moto, which, however, is only just over 100 yd. wide at the narrowest part for depths over 3 fathoms, and has many growing coral patches. It should be used only by vessels with local knowledge.

Anchorage

The Faka'amumei anchorage, to the north-west of Muikuku point, has a depth of 16 fathoms, with a sandy bottom. Off the middle of the island the only safe anchorage for vessels drawing more than 19 ft. is off the entrance of the Ava Tupu, in 12 fathoms, with about 600 yd. swinging room. The inner anchorage, off the town of Pangai, is only about 1,500 by 1,000 yd. in extent, and in the best place the depth is about $4\frac{1}{2}$ fathoms. All the anchorages are exposed to winds from the west; since the low-lying reefs afford little shelter they are therefore apt to be bad from November to April.

Port

Vessels lie at anchor about $\frac{1}{2}$ mile or more from the shore, and cargo and passengers are landed from boats at the small pier, to which there is a boat channel in the shore reef. The town, Pangai, lies close to the landing. Pigs and fowls are fairly plentiful, but beef, vegetables and other supplies are scarce. There is a W/T station in the town.

NEIAFU

Neiafu, the port for Vava'u, lies about 170 miles from Nuku'alofa. It is the best harbour in the group (Fig. 24, plate 3).

Approach

The Ava Pulepulekai, a channel between the islands of Hunga and Nuapapu, is used when bound to Neiafu from the south and west. It is over a mile wide, and is deep and clear of dangers, with the shore steep-to on both sides. Faihava, a deep-water channel separating Hunga from 'Uta Vava'u, is also clear of dangers, and offers a good passage from the north-west.

Anchorage

Deep anchorage in about 29 fathoms may be had in these channels, on sand and coral. Anchorage is also available off the town of Neiafu, south of the wharf, in 18 fathoms, on sand and coral bottom. This anchorage is very sheltered, being land-locked between the north-east coast of Pangaimotu and the south-west coast of 'Uta Vava'u. But the holding ground is said to be indifferent, and the general depths of the harbour as a whole, from 25 to 29 fathoms, are too great for convenience.

Port

Vessels with draught up to 23 ft. lie alongside the wharf, which has a seaward face 200 ft. long. There are also small jetties for boats, several to the eastward and one to the westward of the wharf, each having alongside depths of 5 ft. or less. Facilities at the port are few. There are 5 lighters, of a total capacity of 12 tons, and a small quantity of supplies and water may be had. There is a W/T station in the town.

COMMUNICATIONS

For external contacts and internal communications within the group Tonga relies primarily on sea traffic. In the nineteenth century it was hoped for a time that Tonga would have been included as a port of call on the regular trans-oceanic route across the Pacific, but the development of Fiji prevented this. Till 1932 a passenger steamer of the Union Steam Ship Co. of New Zealand sailed monthly from Auckland, calling at the three Tongan ports as well as at Suva and Apia. After some changes due mainly to the trade depression Tonga was omitted from the schedule, and in 1934-5 the group was without regular communication with New Zealand or Australia. Since 1937, however, the motor vessel *Matua*, 3,500 tons, has run to a regular schedule, and connected the ports of Tonga, Samoa, Fiji and the Cook islands with New Zealand. Other vessels, mainly British and Scandinavian, called occasionally till the outbreak of war to load copra and discharge timber, paraffin and other goods. Inter-island communication is provided by a few small trading vessels, mainly cutters, and by the government M.S. *Hifofua*, which makes regular runs between Nuku'alofa and Neiafu, with occasional calls at Lifuka, 'Eua, Niuatōputapu and Niuafu'ou.

The major islands of the group are plentifully provided with roads, but most of them are of earth surface, not suitable for any heavy traffic in the wet season, and many are still not much more than tracks fit for horse or pedestrian traffic. (The road system as a whole is shown in Figs. 23, 26, 29; but it has not been possible to differentiate between the classes of road.) On Tongatapu, however, there were in 1937 about 45 miles of metalled road suitable for motor vehicles (Plate 4), connecting Nuku'alofa with other settlements; and Vava'u had about 15 miles of metalled or tarred road leading out from Neiafu. The metalling material is coral limestone, the only material available. There were then about 100 motor

vehicles in the group, mostly on Tongatapu and Vava'u, about two-thirds being private cars and the remainder commercial vehicles. The majority were owned by Tongans.

There are no railways in the group, nor prior to the war were there any airfields, though some air facilities now exist.

There is a Tongan government W/T station at Nuku'alofa, with sub-stations at Neiafu (Vava'u), Pangai (Ha'apai), Niuatoputapu and Niuafu'ou, the last three having been opened in 1930. The Nuku'alofa station communicates with Fiji and Samoa, whence messages are relayed to Australia and New Zealand. There are no telegraph stations in the group. A telephone system has been established at Nuku'alofa. Postal communication with the outside world depends on the calls of visiting vessels, mainly the fruit and copra steamers, and may be irregular. Inter-island mails are carried by the government vessel and by cutters. The collectors of customs act as post-masters at Nuku'alofa, Pangai (Ha'apai) and Neiafu. British postal orders are issued and money orders for transmission through Australia.

TONGATAPU GROUP

TONGATAPU (Fig. 23)

Tongatapu, the principal island of the Tonga group, lies approximately in lat. $21^{\circ} 10' S$, long. $175^{\circ} 10' W$. It is roughly horn-shaped, with the base of the horn to the south-east and the tip curving round to the north and north-east. The greatest length is about 18 miles and the greatest width about 9 miles. The name of the island means Sacred Tonga, and with other names, Great Tonga, Chiefly Tonga, also used by the people, it indicates how the island has been the primary centre of the religious and social life. Modern investigation, supporting native tradition, points to a settlement of Tongatapu before that of Ha'apai and Vava'u.

In relief the island is low, with a surface generally level or slightly undulating. There are only two hills of note: Popua or Holohuiki, known also as Cook's hill, 108 ft. high, and Veiongo or Fungasia, known also as mount Zión, 60 ft. high, both near Nuku'alofa. The former by native tradition was cast down from the sky by the god Tangaloa 'Eitumatupu'a to provide good garden soil for his son 'Aho'eitu, the first Tu'i Tonga. In elevation there is a slight trend from the east and south, where the land has a maximum height of about 270 ft., towards the west and north, where the land is very

little above sea level. There are no rivers or permanent streams of any size.

Coasts

The coastline may be considered in two main sections: the western, southern and eastern sections; and the northern section.

In the north-west the island ends in Niuaunofu (Van Diemen point), a low cliff of coral rock, with coconut palms and other trees upon it. From here the coast trends first south-westward, then south-eastward, and for nearly 15 miles it is low and rocky, with long patches of white sand and a steep-to fringing reef extending outwards for a short distance offshore. Towards the south the aspect becomes more sharply defined. At the end of the road from Houma, about 8 miles from the north-west point, the shoreline is bounded by hard jagged limestone cliffs about 35 ft. high, with a wave bench of firmly cemented limestone from 100 to 200 ft. wide at their base. A short distance back from the sea the land tends to rise to heights of 100 ft. or so, and is covered in trees and scrub. As the southerly point of the island is approached the character of the coast becomes more rugged and the cliffs rise. A special feature are the blowholes resulting from the sea breaking with great force against the wave bench and rushing into holes and clefts from which columns of spray shoot up (Plate 6). At Houma Tolua (Cook point), the southern extremity of the island, which is rounded, rocky and wooded nearly down to the water's edge, the cliffs are more than 200 ft. high, and the land behind rises to about 270 ft. above the sea. Here the fringing reef extends off the coast to an average distance of 200 yd. The cliffs, known locally as the *liku*, are almost everywhere precipitous, and only along the courses of the streams which flow down in wet weather is ascent possible without difficulty. At Hufangalupe, westward of Houma Tolua, stream erosion has broken down the sea cliff and from the shore access to the plateau above is easy. Eastwards of Houma Tolua the same formation of broken rocky cliffs and sand patches continues, but the height of the cliffs diminishes again. On this part of the coast there are some caves, the entrances to which are 40-60 ft. above the sea; they contain fresh water up to 8 ft. deep.

The northern section of the coast from Mui Hopohoponga, the eastern extremity of the island, to Niuaunofu, is in strong contrast to the rest. It is bordered by land about 5 ft. above sea level, and protected by a series of offshore reefs which extend to the north-east for about 9 miles, and which enclose about 20 small islands

and islets. The chief of these islands is Atata, with an area of about 130 acres, lying about 4 miles westward of Ava Lahi passage. It is low and wooded, and has about 50 inhabitants. The others, to the south-east and east of Atata, are all uninhabited, low, and smaller still; the principal ones are Poloa, Fafa, Onevai, Makaha'a, Pangaimotu and Oneata. In addition to these, outside the reef system to the east of Piha passage, is 'Euaiki. This island, about 180 ft. high and with an extent of 260 acres, is inhabited by nearly 100 people; it was formerly the pilot station, but landing and embarkation are at times so difficult that use was discontinued. About 5 miles west of Mui Hopohoponga the north coast is broken by the entrance to an extensive shallow lagoon, known as Fanga 'Uta in the inner reaches, which run far into the land. This lagoon is accessible only to boats. Deep within the western reach is an island, Kanatea, about 125 acres in extent and uninhabited. At the western side of the entrance is Nukunuku, a low island about 1 mile long and $\frac{1}{2}$ mile wide, separated from the mainland by a narrow depression a few hundred feet wide, most of which is above water at high tide. The shore of the island is not bounded by a coral reef, but is a sandy flat submerged at high tide and running seaward for about $\frac{1}{4}$ mile, with large limestone boulders at the outer edge. The island carries a small population.

From the entrance to the lagoon the coast runs westward, with a fringing reef about 300 yd. in width, as at Nuku'alofa. The main anchorage lies off this reef. Westwards again, for about 5 miles to Niuaunofu, the reef broadens into a wide flat, with its outer edge about 4 miles offshore. Behind it is an extensive mud or sand flat submerged at high water and in places dry at low water. The shoreline here takes the form of a wide bay, but the flat prevents effective access from the sea.

Anchorage

The Nuku'alofa anchorages have already been described (pp. 87-8). In addition, anchorage may be also had in Maria bay, which is sheltered from northerly seas by the reefs which continue to the north-east from Niuaunofu. The passages leading into the bay are deep, and it affords anchorage westward of Atata in 6 to 12 fathoms.

Settlement and Communications

Three main roads traverse Tongatapu from east to west, and there are also a number of roads crossing these. They are shown on the map (Fig. 23), together with the position of the main towns and

villages. The principal settlements, Nuku'alofa and Mu'a, have been described (p. 51). Other places of interest are Kolovai in the north-west, where the Tu'i Kanokupolu was formerly invested with office, a village noted for the thousands of fruit bats which live in the trees there; Ha'atafu in the extreme north-west, where a monument marks the landing-place of the first Wesleyan missionaries in 1826; and Heketa, near Kolonga in the extreme east of the island, where stands the famous trilithon Ha'amonga 'a Maui.

'ATA

The most southerly island of the Tongan group, 'Ata lies in lat. $22^{\circ} 20' S$, long. $176^{\circ} 12' W$, about 85 miles south-west of Tongatapu. It was sighted by Tasman in 1643, as he sailed from New Zealand, and he gave it the name of Pylstaart (Tropic-bird) island. The native name means reflection. The island, which is $1\frac{1}{2}$ miles long, is of volcanic origin, but volcanic activity is extinct, and the island now displays two lofty peaks, the northern one 1,165 ft. high and the southern 1,159 ft. high. It is steep and wooded.

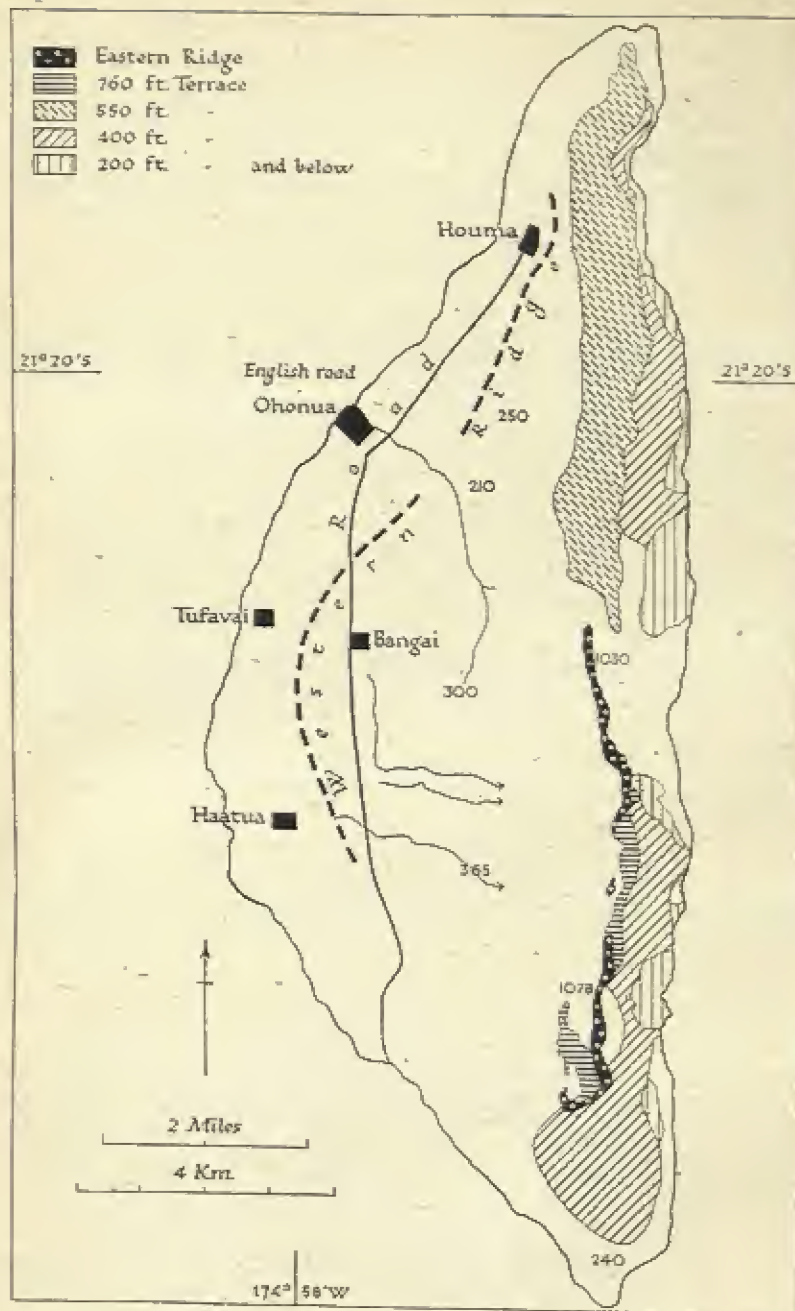
'Ata has deposits of phosphate, but the lack of a harbour has hindered their development. The island is now uninhabited. It formerly had a small population, the origin of which is variously attributed to drift voyagers from Tofua and from Houma in Tongatapu; to refugees from Atata fleeing from invasion; and to an elopement with a daughter of a Tu'i Tonga. All these may have contributed elements. The island was peopled before the end of the eighteenth century, the single settlement being known as Kolomaile, with a maximum population of about 200. In 1862 or 1863, however, a Peruvian slaving vessel kidnapped a number of people by trickery, after which King George Tupou I ordered the remainder to be removed. Their descendants now live in 'Eua. The isolation of the island and lack of a harbour have not attracted settlement again.

There is said to be anchorage on the west side of the island, and from a beach there a trail leads up the hill slope.

'EUA

'Eua lies at the southern end of the Tonga archipelago, in lat. $21^{\circ} 20' S$, long. $174^{\circ} 57' W$. Its long axis lies nearly north and south, and its greatest dimensions are about $12\frac{1}{2}$ miles by $4\frac{1}{2}$ miles (Fig. 25). The geology of the island has already been described (pp. 18, 21).

'Eua is dominated by an eastern ridge, about 10 miles long, and 1 mile wide at its broadest, in the middle and south. The southern half of the ridge is in most places 200-250 ft. higher than the northern half, the highest points having an elevation of about 1,000 ft. above sea level. As a whole, the top of the ridge is an open grass-covered area, on which herds of semi-wild horses run, but there are scattered patches of dense vegetation, indigo, lantana weed and even large trees. The centre of the ridge is very rugged, with high, round-topped treeless hills. Erosion here is rapid, and there are many small stream-beds which contain water only at times of heavy rainfall; most flow to the west. These stream-beds are covered in by dense vegetation, which hides their V-shaped channels, in places as much as 100 ft. deep. The south of the ridge is marked by a high narrow backbone of bare limestone, flanked by steep cliffs to seaward but sloping on the other side to the undulating surface of the main part of the ridge. In many places this backbone is no more than a thin wall of limestone 4 or 5 ft. above the general level,



but in parts it is 30 ft. high and 50 ft. broad at its base; to the west of it are many limestone pinnacles protruding from the soil, from 1-12 ft. high. The northern part of the ridge is relatively level, but a single hill known as Te Moa rises from the general surface to a height of 740 ft. On this part of the ridge are patches of thick scrub and isolated pandanus and coconut palms. Sinks, i.e. solution-depressions in the limestone, are numerous, and a few tiny lakes exist in the volcanic areas.

Along the seaward side of the whole eastern ridge the descent to the sea is made by sheer limestone cliffs interrupted by a series of well-defined terraces, which give the impression of a gigantic staircase (Fig. 7). These are narrow and broken in parts, but elsewhere are over 1,500 ft. broad. Their surface is generally smooth, though some have limestone pinnacles, but they are covered with such dense vegetation that they are difficult to traverse. There are only two small streams on this side of the island. One, the Vaingana, near the south side, cuts part way across the 400-ft. terrace, goes underground, and emerging from the side of the cliff at an elevation of about 160 ft. plunges as a small waterfall into the sea.

The western side of the main ridge is very different, being composed of a red volcanic tuff. Here a gentle slope heavily wooded leads down to a central valley, but is broken by a vertical limestone cliff from 40 to 80 ft. high, facing eastwards and marking the junction of the volcanic material with the limestone. Three or more permanent streams occur in the middle of this slope. One of them plunges down as a waterfall into a funnel-shaped sink hole known as Ana Aha, the Smoky Hole, from the spray, and must ultimately find its way out to the sea through subterranean channels in the limestone.

The central valley is a gentle depression, with its deepest part about 170 ft. above sea level, opposite the village of 'Ohonua. The valley bottom is covered with dense brush and trees, with open grassy spaces at intervals. Through it runs a deep ravine made by the main stream which ultimately emerges at 'Ohonua. In the ravine, which is about 400 ft. wide at the top, are lianas, tree ferns and other thick vegetation.

On the other side of the central valley lies the western ridge, with a maximum elevation of 400 ft., flat-topped and with moderate slopes. It is composed almost entirely of coral limestone.

'Eua presents very largely a cliff coast. Along the eastern side, where the cliffs are from 100 to 400 ft. high, the waves have cut deep clefts and caves. The most notable of these is the Matalanga near the southern end of the island, where the sea has exposed the volcanic tuff in a deep cave, leaving the limestone as a natural bridge about 80 ft. thick above. On the western side of the island the cliffs are less steep, with a height of 20-30 ft. There are many beaches around the island, at the foot of the cliffs, or where no cliffs are present. One of the largest of these is in the vicinity of 'Ohonua, extending northward about $\frac{1}{4}$ mile from the village and southward about a mile. On the eastern (windward) side the beaches are made up largely of boulders, or coral blocks, but on the west side there is commonly a narrow strip

Fig. 25. 'Eua, Tonga: relief and settlement.

Main terraces on the eastern side of the island are shown, but information is lacking for the central part of the eastern side. Small terraces at 100 ft. and 340 ft. have been omitted. The relief of the western part of the island can be further seen from Fig. 7. The streams in the central part of the island disappear in the depression. (In the place-names 'Ohonua and Ha'atua, glottal stops have been omitted.) Based on: (1) J. E. Hoffmeister, *Bernice P. Bishop Museum Bulletin*, no. 96, figs. 1, 2 (Honolulu, 1932); (2) A. H. Wood, *History and Geography of Tonga*, p. 77 (Nuku'alofa, 1932); (3) J. J. Lister, 'Notes on the Geology of the Tonga Islands', *Journal of the Geological Society of London*, vol. XLVII, p. 590 (London 1891).

of white sand. The beach approach, however, is made somewhat difficult by the presence of an outer edge of old fringing reef, several hundred feet wide, and elevated some 2-4 ft. above high tide. This old reef has a very rough pitted surface, with tortuous channels running through it, and beyond it is the present fringing reef of living coral and other organisms, with an average width of 100 ft. on the eastern side of the island, and 200 ft. on the western side. At the outer edge of this reef platform, where the surf strikes on it, is the common lithothamnium ridge, rising from a few inches to several feet above the reef itself, and forming with its knobby, spongy growth of algae a protection for the corals behind.

The best anchorage is in English road, where Captain Cook first anchored in October 1773. This is on the north-west side of the island, opposite the village of 'Ohonua, anchorage being in about 25 fathoms about 600 yd. offshore. It is unsafe, however, with westerly winds or swell.

There are four villages on 'Eua, all on the western side of the island. 'Ohonua is the chief one. Three of them, Houma, 'Ohonua and Pangai, are connected by a government road which crosses the western ridge in several places, reaching a height of about 350 ft. above sea level south of Pangai.

HUNGA HA'APAI AND HUNGA TONGA

Two small islands lie north of the north-west point of Tongatapu, Hunga Ha'apai being 3½ miles distant, and Hunga Tonga 1 mile to the north-east again. Both are uninhabited. Phosphate deposits are said to exist there, but in the absence of anchorage they have not been worked. On Hunga Ha'apai a ridge 400 ft. high at the northern end and 340 ft. at the southern end runs the length of the island and falls in high cliffs to the sea on the eastern side. The western side is a set of grassy slopes with sparse bushes and a few coconut palms, with low cliffs. Hunga Tonga has steep cliffs above which the ground rises in a ridge with a peak 490 ft. high at the northern end.

FONUAFU'OU (FALCON ISLAND)

A product of submarine eruption, its Tongan name means 'New Land'. This has been alternately a shoal and an island, since it is formed only of volcanic ash and scoria, which is easily washed down by the wind and waves. It is, of course, uninhabited, and no animal or vegetable life exists there; no growing coral has been found. Its history since the first report is given in Chapter III (pp. 24-8).

HA'APAI GROUP

The Ha'apai group is a scattered archipelago of small islands which form a number of sub-groups: the Nomuka group in the south; the Kotu group in the centre; Tofua and Kao to the west; and the Ha'apai group proper to the east. The former are sometimes treated quite separately from the Ha'apai group proper, and various other arrangements of the islands in groups are sometimes given. The eastern islands as a whole stand upon a bank of irregular shape bounded by the 100-fathom line (Fig. 26), but many of the others rise abruptly from deep water, with depths in some cases of more than 200 fathoms around them. For the most part the islands are

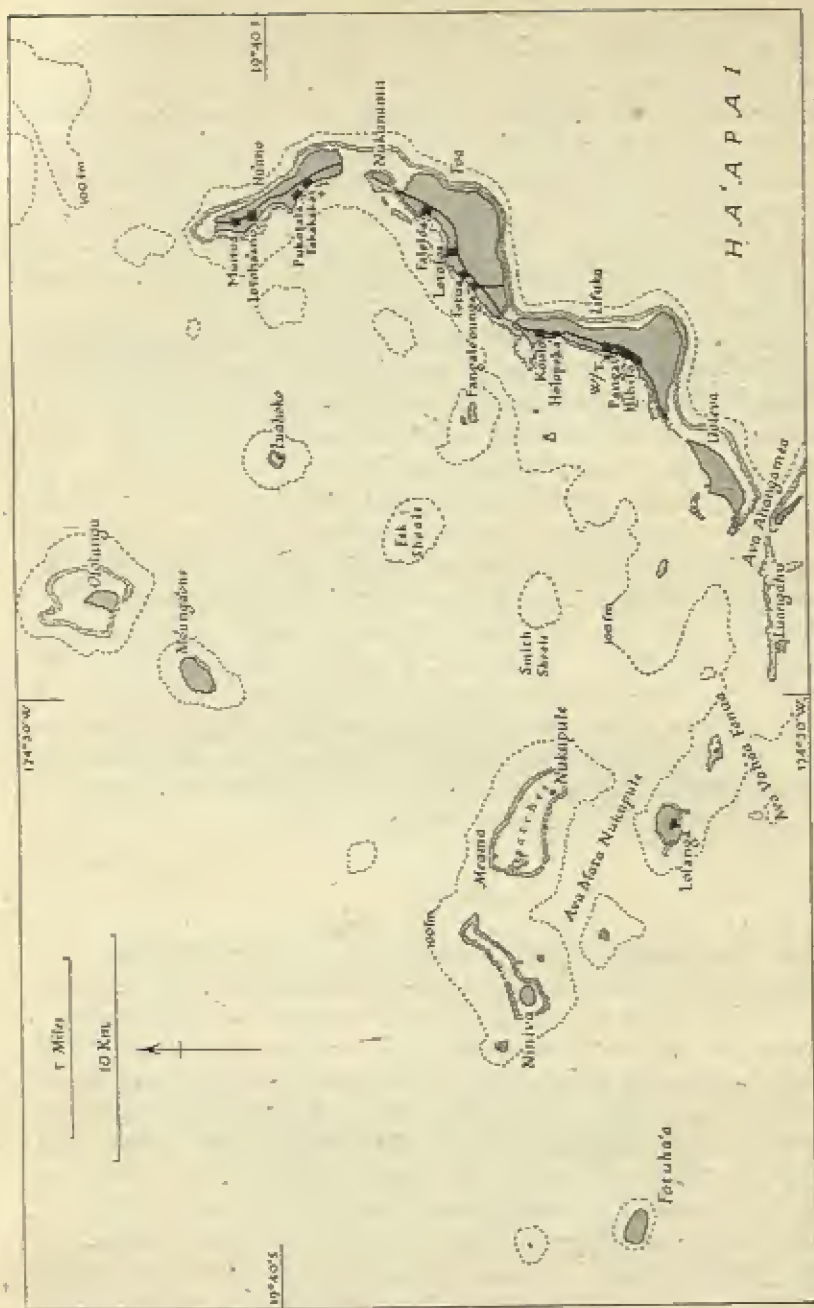


Fig. 26. Ha'apai; major islands of the northern group. Based on Admiralty chart no. 3099.

similar in character—low, flat-topped and wooded, with white sandy beaches, and entirely surrounded by reefs. Exceptions to this are Fotuha'a, Lofanga and Mo'unga'one, which are rather higher, with a coastline of cliffs and little or no reef; and Tofua and Kao, which are in the same latitude but stand well to the west, and are high volcanic cones. Coasts, anchorages and approaches are best described for the individual islands as they occur, but it may be mentioned here that anchorages are few, that the main one is off Lifuka island, and that the principal approach to it is through the barrier reef on the eastern side of the group, by Ava Matamata Vika.

The Ha'apai group proper, known also as the Hahake or Eastern group in relation to the other sub-groups, comprises three major islands, Lifuka, Foa and Ha'ano to the eastwards, and a number of smaller ones to the south and west. The main islands in effect stand on a long barrier reef which outlines the eastern part of the group, and which extends south to shelter the Kotu group as well. Through this reef are two passages, Ava Ahanga Mea, about the centre, and Ava Matamata Vika to the south. The former is 800 yd. wide, but has a shoal with only 3 or 4 fathoms over it in mid-channel, and this, combined with the swift tides, renders it suitable only for small vessels in favourable conditions; it can be highly dangerous for boats. Ava Matamata Vika is about 1,200 yd. wide, with depths of 20-35 fathoms in the centre; it has also strong tidal currents but is the only navigable passage for large vessels. Anchorage inside the channel may be found in 18 fathoms on sand and coral bottom to the westward of three islets on the reef.

LIFUKA

Lifuka, the principal island of the group, is $4\frac{1}{2}$ miles long and very narrow, tapering from $1\frac{1}{2}$ miles broad at its southern end to less than $\frac{1}{2}$ mile at the north. On the eastern side there are low cliffs (the *liku*), especially to the north and south; on the western side the land rises gradually from the water's edge, and there are many reefs and shoals offshore. The northern end of the island is known as point Port au Prince, from the English privateer which was attacked at Lifuka in 1806. The north-west point, off which Cook anchored in 1777, is called Muikuku. (For description of the anchorage see p. 88.)

Roads of coral limestone, mostly suitable for motor traffic, run from north to south, linking up the villages. Lifuka is thickly populated and practically the whole of the island is under cultiva-

tion. Probably as a result of the comparative land scarcity the people of Lifuka, in common with the others of the Ha'apai group, are skilful navigators and fishermen. The chief settlement is Pangai, with population of about 1,000; it has a W/T station and a hospital.

FOA

Foa, lying about 800 yd. to the north of Lifuka, is of similar character. It is 4 miles long in a north-east and south-west direction, and about $1\frac{3}{4}$ miles wide. A low cliff forms the eastern shoreline, but the western coast is a sandy beach with rocky points. The shore reef on the western side is much broken up, and there are several coral patches lying close by. The island has a total population of about 1,000, distributed in four villages.

HA'ANO

Ha'ano, the northernmost of the three major islands of the group, lies about 1 mile to the north of Foa. It is $3\frac{1}{2}$ miles long, north-west and south-east, and $\frac{1}{4}$ to $\frac{1}{2}$ mile wide. This island is of the same general type as the other two, and carries a population of similar size.

'UIHA

'Uiha, lying 5 miles north-eastward of Ava Matamata Vika, is $1\frac{1}{2}$ miles long and about 100 ft. high. There are about 500 inhabitants, living in two villages on the western side. 'Uiha was the burial place of a number of great Tongan chiefs, and the finest burial mound in Tonga is situated in the north-west of the island. Tatafa and Luangahu, two small islands, lie to the north-west of 'Uiha, on the south side of Ava Ahanga Mea.

UOLEVA

Uoleva, on the northern side of Ava Ahanga Mea, is nearly $2\frac{1}{2}$ miles long and covered with trees. It is uninhabited, but formerly bore a population, and on it are a large number of mounds used by chiefs in ancient times when trapping pigeons.

OFOLANGA

Ofolanga is the northernmost island of the Ha'apai group as a whole. It is low and $\frac{3}{4}$ mile long by about $\frac{1}{4}$ mile wide, with a sandy coastline. It is uninhabited, but the people of Mo'unga'one visit it for fishing and have built some huts on the southern shore. The island is surrounded by a barrier reef, which encloses a lagoon of some size.

Southward of Ofolanga the barrier reef forms an indentation, where anchorage in 13 fathoms on a sand bottom may be obtained about 400 yd. from the reef. The anchorage is protected from northerly and easterly winds, and landing may be made through a break in the reef near the south-east corner of the island. This is practicable for boats except at low water or when there is much swell.

MO'UNGA'ONE

Mo'unga'one lies 2 miles south-west of Ofolanga, with a deep channel between them. It is a flat-topped wooded island, 1 mile long and $\frac{1}{2}$ mile wide, with a rocky coastline of low cliffs. Fringing reefs are absent except on the south-east side, where there is a sandy beach fringed by a reef which extends about 200 yd. from the shore. The 100-fathom line lies about $\frac{1}{2}$ mile from the shore, and there is no anchorage. Landing may be made only in fine weather. The population is about 150.

NINIVA

Niniva, a flat-topped wooded island, uninhabited, with an area of about 120 acres, lies in the southern part of a lagoon about 12 miles to the westward of Lifuka. This lagoon is formed by Hakau Houmaulu, a reef about 3 miles long and 1 mile wide. Ava Houmaulu, a deep channel about 1 mile wide, separates Hakau Houmaulu from Hakau Lahi, and Ava Mata Nukupule, another channel, separates Hakau Lahi from Lofanga.

Meama and Nukupule are two islets, with area of 5 acres and 8 acres respectively, lying in a lagoon about $2\frac{1}{2}$ miles long and $1\frac{1}{2}$ miles wide, some 3 miles to the eastward of Niniva. The lagoon is formed by Hakau Lahi, a continuous reef. Both islets are uninhabited.

LOFANGA

Lofanga, lying about 8 miles west of the south-west point of Lifuka, is an island 1 mile long with an area of about 360 acres; it is flat-topped and wooded, and about 150 ft. high to the tops of the trees. The shoreline consists of low cliffs, and a narrow fringing reef borders the eastern and southern sides. This reef affords some protection to boats, and landing may be made on the southern side, where there is a village. The population is about 250.

FOTUHA'A

Fotuha'a, lying about 9 miles westward of Lofanga, is an island about 1 mile long, east and west, flat-topped and wooded, the tops of the trees being about 200 ft. above sea level. Cliffs 80-90 ft. high form the shoreline. Landing is possible only in fine weather, either in a small cove on the southern side or by climbing the cliffs at a spot on the north-eastern side. There is no anchorage. The island has a population of about 100.

Fatuinangi, about 2 miles north of Fotuha'a, is a small flat rock 10 ft. high; it is uninhabited. The passage between this and Fotuha'a is called Ava Tauofi.

NOMUKA GROUP

The Nomuka group (known also as the Mu'omu'a group) is the southernmost of the Ha'apai sub-groups, with its own reef system. The whole area within this group is studded with reefs and shoals and is not suitable for navigation except when favourable light allows the dangers to be seen. The variable direction and strength of the currents add to the difficulty.

Nomuka (Fig. 27), the principal island of the group which bears its name, lies in lat. $20^{\circ} 16' S$, long. $174^{\circ} 48' W$. It is of coral formation in the shape of an equilateral triangle, with sides 2 miles long, and has a large saltwater lagoon, 443 acres in extent, in the middle. West of the lagoon there is a ridge, with peaks 166 ft. and 162 ft. high at the northern and southern ends respectively. A narrow coral

reef fringes the island, but there are breaks in it by which boats may approach the shore. The island has a population of about 500 and is well cultivated, with many



Fig. 27. Nomuka, Tonga

Based on Admiralty chart no. 474.

coconut palms. It was visited extensively by the early voyagers, and the pond of fresh water from which Tasman, Cook, Bligh and others took supplies is still pointed out.

Nomukaiki (the name meaning 'Little Nomuka') lies 1 mile south-westward of

its larger neighbour and is 1 mile long and $\frac{1}{2}$ mile wide, rising to a height of 147 ft. at its southern part. The island is surrounded by a coral reef, which forms a dangerous salient to the south and east. It is uninhabited.

Nomuka harbour lies between the two islands, with anchorage in 12-14 fathoms on coral sand. It may be approached either from the west or from the east. The harbour is open to the north-westward, but is well protected in other directions by islands and reefs.

Mango, lying about 5 miles south-east of Nomuka, is about 1 mile long and $\frac{1}{2}$ mile wide, and reaches heights of 139 and 141 ft. at its north-western and south-eastern ends respectively. It supports a population of rather less than 100, with a village on the northern side. There is good landing opposite the village, and a small boat-harbour lies about 400 yd. to the eastward. Small islets in the vicinity to the north are Mangoiki, Nukufaiu and Nukurula, all uninhabited.

Fonoifua, lying about 6 miles north-east of Mango, with an area of about 40 acres, is a low island rising to a cliff 67 ft. high on the northern shore. It supports a small population, and there is a village in the centre of the south coast where there is a boat landing through the reef. Tano'a, an islet about $\frac{1}{2}$ mile to the southward, is 57 ft. high, and has a good boat harbour in the reef on its north side. It is uninhabited.

Tonumea (lat. $20^{\circ} 28' S$, long. $174^{\circ} 46' W$), in the southern part of the group, is 138 ft. high and thickly wooded. It has an area of about 30 acres and is uninhabited. Water of poor quality may be obtained in small amounts from a well about half-way along the cliff on the western side. Landing may be made through a break in the northern side of the reef, except in northerly winds. Kelelesia, of about the same size and 123 ft. high, lies nearly 3 miles to the south-east of Tonumea, with no safe passage between them. It also is wooded and uninhabited.

'OTU TOLU

This group comprises three small islands situated on the same reef system as the Nomuka group, of which it is really the eastern fringe. The islands lie about 15 miles east-south-east of Nomuka. They are low, level, wooded and uninhabited, and there is no fresh water on them. The northernmost, Telekivava'u, has no special features. Good landing can be made on Lalona on the northern end, and on Telekitonga, the southernmost, to the north of its south-west end. Fetokopunga is sometimes included in this group.

KOTU GROUP

A subsidiary of the main Ha'apai group, this is sometimes treated as a part of the Lulunga or Western Ha'apai group. It comprises a cluster of small low islands, the principal of which are Kotu, Ha'afeva, Tungua and 'O'ua. There are no good anchorages in this group, depths off the islands being generally from 30 to 40 fathoms. Ava Fonuaika, a break in the reef to the west of Fonuaika island, is the best channel from which to approach the group from the southward, while from the eastward it may be approached by 'Ava Matamata Vika, which is the main passage for the Ha'apai group as a whole. Kotu, lying in lat. $19^{\circ} 57' S$, long. $174^{\circ} 48' W$, is the westernmost island of the sub-group. It is about $\frac{1}{2}$ mile long and $\frac{1}{2}$ mile wide, low, flat-topped and thickly wooded. The southern end is faced by reddish cliffs about 30 ft. high, but the northern part is low, with a sandy shore. It carries a population of rather more than 100 inhabitants. Putuputua, a sand cay about 12 ft. high, stands on a reef about 3 miles north-east of Kotu, and is the most northerly island of the group.

Ha'afeva, $4\frac{1}{2}$ miles east of Kotu, is the largest island of the Kotu group. It is

about $1\frac{1}{2}$ miles long and $\frac{3}{4}$ mile wide, flat-topped, with a sandy shoreline. A barrier reef surrounds the island for the most part, and on the south-eastern side it is more than 1 mile offshore, forming a deep-water bay. Vessels can anchor here in 27 fathoms, on sand and coral, and through a narrow fringing reef on the eastern side of the island a boat channel leads to the village. The island has about 400 inhabitants. Teupa and Fetoa are islets in the vicinity. Matuku, lying between Kotu and Ha'afeva, is about $\frac{1}{4}$ mile long, with an area of 83 acres. It is low, flat-topped and wooded, with reddish cliffs at the eastern end. It has a population of rather less than 100. Tungua (lat. $20^{\circ} 01' S$, long. $174^{\circ} 46' W$) is nearly circular in shape, with a diameter of about 1,500 yd. It is low and flat, with cliffs on the south-western side. There are about 200 inhabitants. In ancient times Tungua was the residence of the Tamaha, the person of highest rank in Tonga (p. 60). 'O'ua, about 4 miles to the east of Tungua, is about 240 acres in extent, with a coastline of low cliffs, and an extensive reef surrounding it, making approach difficult. It has a population of about 150; oranges form part of its produce. Other small low islands in the south of the group are Tokulu, Fonoaika and Lekaleka, all uninhabited.

TOFUA

Tofua (lat. $19^{\circ} 45' S$, long. $175^{\circ} 05' W$) is situated to the westward of the Ha'apai group proper and is separated from Kotu by a deep channel 15 miles wide. The island is about 5 miles long and 4 miles wide, and appears flat-topped from the sea, with hills from 1,500 to 1,600 ft. high, rising steeply from the coast except on the north-west side. Here the slope is more gradual, and forms the walls of a large crater in which there is a large freshwater lake. The island is a volcano, which was in active eruption in 1890; in 1939 steam was rising from the crater to a great height. On the south and south-west sides the hills are wooded to the summit, but the north and north-east slopes are barren except for wooded ravines. Off the eastern point of the island anchorage may be had in 14 fathoms 600 yd. offshore, though a little further out the ledge slopes steeply from 15 fathoms into deep water. On the southern and eastern sides of the island there are numerous beaches on which landing may be made in fine weather.

Tofua was inhabited in olden times, the village being called Manaka. In 1789 Bligh and his men, after being cast adrift from the *Bounty*, called at Tofua to get water and were attacked by the natives, the quartermaster being killed. The island has been without permanent settlement since 1854, when King George Tupou I ordered it to be abandoned because of the danger from eruptions. Coconut palms grow on the lower slopes, however, and the island is frequently visited by people from Fotuha'a, Matuku and Kotu, who cultivate gardens there, hunt the wild pigs, and take away black volcanic stones to use as grave decorations. In ancient times the god of Tofua was said to have been a chief's son who committed suicide by drowning and was then transformed into a huge man-eating shark. To modern Tongans the volcano is one of the entrances to the underworld of spirits after death.

KAO

Kao, lying 2 miles northward of Tofua, has an area of nearly 5 sq. miles. It is an extinct volcano, with a conical peak rising to a height of 3,380 ft. and easily visible from Lifuka, 35 miles to the eastward. The lower slopes are wooded, but the upper slopes are barren except in the deep wooded ravines. There are two craters, one on the northern side and another on the southern side, the latter having a pool of fresh water, which is the only source of drinking water on the island. The coast is rocky, with cliffs at many places, and is steep to all round. There is no anchorage, but there is a landing place at the southern end of the island.

Kao was once inhabited, the village being near the shore, probably on the north-western side. But like Tofua it now carries no permanent population, though it is visited for cultivation by people from the neighbouring islands.

LATE

Late, in lat. $18^{\circ} 48'$ s, long. $174^{\circ} 39'$ w, is a high volcanic island situated about 53 miles north-north-westward of Ha'ano. It has an area of over 6 sq. miles, and the land rises symmetrically to a peak 1,700 ft. high. There are two craters, a small one near the east coast, with a lake in it, and a large one immediately below the peak. Both are dormant, though a little smoke has been observed at times emerging from the sides of the larger crater. On the south, east and north sides, the upper slopes are bare and rugged, with deep fissures, but scrub grows on the lower slopes. On the west side the island is well wooded, with some coconut palms. The coast consists mainly of cliffs.

Off the north side of the island anchorage may be had on a shelf in 15 fathoms on sand and stones. The landing place is also on the north, in a small indentation of the coast, but it is poor, a jump having to be made to a rock from a boat lying alongside. Late was formerly inhabited and served at times as a place of refuge for political exiles. The people of Late had a feud with those of Mo'unga'ope, and a fort with a stone wall, of which the remains still stand, was built against raiders from that island. The descendants of the former inhabitants now live on Hunga in the Vava'u group, and people from Vava'u occasionally visit the island to collect coconuts and bananas from their cultivations there. Wild pigs and pigeons are abundant.

VAVA'U GROUP

The Vava'u group, lying about 60 miles north-east of the Ha'apai group, consists of the large island 'Uta Vava'u, which comprises about three-fifths of the land area, and about 40 smaller islands lying immediately to the south and south-west of it (Fig. 28). The islands are comparatively high, flat-topped or undulating, thickly wooded and very fertile (Plate 1).

'UTA VAVA'U

'Uta Vava'u (lat. $18^{\circ} 37'$ s, long. $174^{\circ} 00'$ w) was the last part of Tonga to be discovered by Europeans; it was first seen by Maurelle, a Spaniard, in 1781. The island is composed of elevated coral limestone, the greatest height being 670 ft. above sea level. The most prominent hills are Mo'ungalafa (610 ft.) at the south-west end of the island, and Talau (430 ft.) behind Neiafu to the west of the town. To the north-east of Mo'ungalafa lies Ano lagoon, shallow at its eastern end but very deep at the western end.

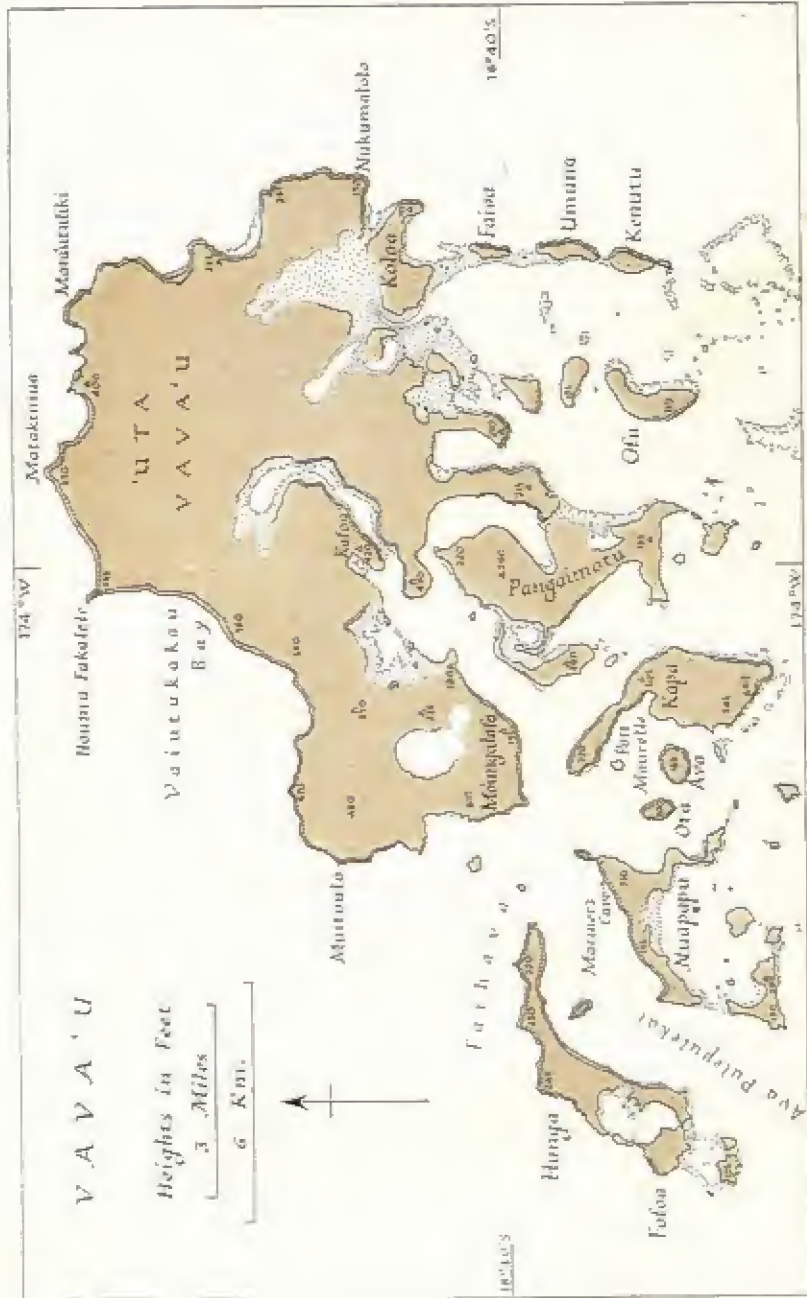


Fig. 28. Vav'u; physical

Heights are indicated where information is available; the decrease in elevation from north to south of the group is noticeable. Based on Admiralty chart no. 3008.

Coasts

The northern and southern coasts of 'Uta Vava'u are in strong contrast. The whole northern coast from Muioulo, the bold headland forming the western end of the island, to Nukumalolo, the south-east point of the island, is bounded by steep cliffs. They range from 200 to 600 ft. in height and are generally covered in vegetation, with landslips showing here and there in white patches (Plate 5). There are no very deep indentations in this stretch and little fringing reef. The southern coast is comparatively low, deeply indented and fronted by many small islets, while reefs are numerous.

On the northern coast, the most prominent feature after Muioulo headland, which is 645 ft. high, is Houmafakalele, a narrow promontory 370 ft. high, with Vaiutukakau bay separating them. From Houmafakalele the coast trends to the north-east for about 2 miles to Matakiniua, a grassy knoll 550 ft. high near the edge of the cliff, and thence eastwards for another 2 miles to Mata'utuliki. From this cape the coast then turns southward and the cliffs tend to decrease in height. Two small bays open here, but their eastward exposure and rocky bottom render them useless for anchorage; they are fringed with reef at the heads.

From Nukumalolo, the south-eastern point of the island, the coast proceeds in a general south-west direction, but is broken by four long bights. All of them are unsuitable for navigation. Three are fronted by coral reef with sandy flats behind, which either dry out at low tide or impound large stretches of shallow water. The fourth, leading to the village of Makave, is very deep. After about 5 miles Ahanga passage, a narrow opening, separates 'Uta Vava'u from the adjacent island of Pangaimotu. This passage, 50 yd. wide, is almost blocked by reefs and is possible only for boats near high water. It leads into a narrow inlet between the two islands, and the northern part of the inlet constitutes Neiafu harbour (p. 88, Plate 3). A little to the westward of Neiafu harbour the coast of 'Uta Vava'u is marked by a promontory, on which rises Muioulo, a flat-topped wooded summit. Northward of this promontory a narrow arm of the sea, Vaipu'ua inlet (Plate 2), curves round inland and to the west for about 2½ miles, with a ridge of hills along its western side. One of these hills, Kafoa, is a conspicuous summit with a crown of casuarina trees. South-west of the promontory, across a bay, lies Teleki point (130 ft. high) with a narrow fringe of reef bordering it; thence a rocky coast with low cliffs trends south-west and then south to Fata point, the south-west extreme of 'Uta Vava'u, imme-

diately beneath Mo'ungalafa. From this point the coast runs north-westward to Maitoulo, with Port Refuge, a shallow indentation, in between.

Anchorage

Throughout the Vava'u group, the water, except in shoal areas, is very deep, and anchorages are few and indifferent. The principal anchorage is in Neiafu harbour, which has already been described (p. 80). Anchorage may also be obtained in Vaiutukakau bay, on the north-west side of 'Uta Vava'u, in 20 fathoms, about 500 yd. from the shore, but it is subject to violent gusts from the high land when the wind is fresh. Port Refuge, on the west side of 'Uta Vava'u, despite its name, is an inconvenient anchorage since it is fully exposed to westward and the depths are great (between 30 and 50 fathoms a short distance offshore).

Landing

Landing may be made from boats at several points on the south coast, but apart from Neiafu the only place with facilities is Tu'anuku, a village about a mile south-west of Teleki point, where there is a stone jetty alongside which small craft can lie.

Communications (Fig. 29)

The villages on 'Uta Vava'u are connected by a system of roads. For the most part these are little more than tracks suited for foot and horse traffic and become very muddy in wet weather. Around Neiafu, however, there are about 15 miles of metalled or tarred road suitable for motor traffic.

OTHER ISLANDS

From the south-eastern end of 'Uta Vava'u two parallel chains of islands extend southwards for about 4 miles. The eastward chain consists of Koloa, Faioa, Umuna and Kenutu, connected with 'Uta Vava'u and one another by reefs, and faced for the most part by steep cliffs. Koloa, the largest, has an area of about 1 sq. mile and carries a population of about 150 living in two villages; the others are uninhabited. The westward chain consists of Okoa, 'Olo'ua, Mafana and Ofu. All but Mafana have a small number of inhabitants, and Ofu, the largest island, has an area of about $\frac{1}{2}$ sq. mile. To the south of these two chains, for about 10 miles, there stretches a succession of reefs with a few islets upon them, the largest of these being the wooded but uninhabited Taula and Maninita. These reefs form an eastern barrier to the southern part of the Vava'u group, and though a channel, the Ava Fonua Unga, is shown on the chart, it is not suitable for navigation.

South of the centre of 'Uta Vava'u lie the two islands of Pangaimotu and Utungake. Pangaimotu, with a greatest elevation of 290 ft. and an area of about



Plate 9. Royal Palace, Nuku'alofa, Tonga

The building is of wood. The wide verandahs are characteristic of most dwellings in European style in the Pacific, though the high roof and upper storey are unusual in the islands.



Plate 10. Levuka in 1879

This view shows the town when it was the administrative and commercial centre of Fiji. Most of the buildings were erected during the boom years of the cotton trade.



Plate 11. View in the north of Viti Levu

Scenery typical of that on the road from Tavua to Nandarivatu. It shows the *talasinga* country with cane grass and occasional patches of woodland.



Plate 12. Nandarivatu, Viti Levu

A view of the hill station.

3½ sq. miles, is closely connected with the mainland by a coral reef, and helps to form Neiafu harbour. The island is of very irregular shape and is well wooded, with much cultivation. It carries a population of nearly 400, with Pangai on the west and Utulei on the north as the main villages (Plate 7). Utungake, practically a westward extension of Pangaimotu, is long and narrow, with a greatest height of 290 ft. Its northern point, Hikutamole, is a sandy beach with rocks off it, and this, Lotuma islet and Muitafuna, the sandy northern point of Pangaimotu, constitute the main features on the eastern side of the near approach to Neiafu harbour.

To the south-west of Pangaimotu lies Kapa, a large island with an area of rather more than 2 sq. miles, rising to a greatest height of 345 ft. on a plateau in the south-west. Mount Teisina, a prominent hill 315 ft. high, lies at the southern end. The coast consists mainly of cliffs, with a few sandy beaches and coral reefs at many parts. To the north the island is connected with Utungake by a reef, through which there is a boat channel south of the little wooded islet of Mala. A bay on the western side forms Port Maurelle, but this is too confined and has too great depths (over 30 fathoms a little distance offshore) to be a convenient anchorage. The island has a population of over 500, distributed in several villages.

About a mile to the south-east of Kapa lies Taunga, a small irregular shaped island about 90 acres in area, surrounded by coral reefs. It has a population of about 100. Westwards of Kapa are the two small steep-sided uninhabited islands of Ava and Ota, while a little further still, about 1½ miles from Kapa, is the narrow and greatly indented island of Nuapapu. This is comparatively flat-topped, with a greatest height of 210 ft., and has a coastline of steep cliffs, except on the southern side, where there is a broad sandy beach. Nuapapu is wooded, and has a population of about 200, living in two villages. On the north-west is Mariner's Cave, a cavern to be entered only by diving, and famous in Tongan tradition as a refuge. Vaka'eitu, to the south of Nuapapu and connected with it by a coral reef, has a greatest elevation of about 200 ft. and an area of about 150 acres. The western and southern coastline consists of cliffs, and most of the remainder is fringed by coral reef. The island is uninhabited. Southwards of Vaka'eitu lies Ovaka, with a greatest elevation of 190 ft. and an area of about ½ sq. mile. The coast is cliffed and steep to at its western end, and a reef extends for some 3 miles to the eastward of the island, with several islets upon it. Ovaka is wooded, and has a population of about 200.

To the westward of Nuapapu and Vaka'eitu lie Hunga and Fofoa, the most westerly islands of the Vava'u group. They form practically one island and together extend for nearly 4 miles in a south-westerly direction. The greatest elevation of Hunga is 245 ft.; that of Fofoa is 255 ft. The coastline of both consists mainly of steep cliffs. The south-west part of Hunga with the north-east part of Fofoa and the islet of Kalau on the west between them encircle a sheet of water with depths of over 30 fathoms; entrance to this, however, is barred by reefs. Hunga, with an area of nearly 2 sq. miles, is well wooded and has a population of about 200; Fofoa is uninhabited.

In the south of the group there are a number of other small islands, mostly low, flat-topped and wooded, with fringing reefs around them and deep water separating them from one another. The highest and most conspicuous of them is 'Euakafa. This really forms part of the same reef system as Ovaka, from which it lies 3 miles to the eastward. 'Euakafa has a greatest height of 270 ft. and is flat-topped; it has an area of rather more than 100 acres. It has no inhabitants at the present time, but formerly had some population. The great tomb of Talafaiva, wife of the Tu'i Tonga Tele'a, who ruled about the beginning of the seventeenth century, is on 'Euakafa.

NORTHERN ISLANDS

FONUALEI

Fonualei, about 40 miles north-west of Vava'u, was discovered in 1781 by Maurelle, who named it Amargura ('bitterness') because of his disappointment at not getting food and water there. The island is of volcanic origin. Around a central crater rises a ring of hills which have been breached on the north-western side, thus giving access to the crater from the shore. On the south side a small ridge runs east and west and is covered in vegetation; it rises to a sharp, well-defined summit 600 ft. high, from which light-grey-coloured cliffs fall steeply to the sea. On the west side of the island a broad barren ridge of lava rises to a height of 500 ft.; a lower ridge lies on the eastern side. Cliffs ring the coast except on the north-west side, where a small bight with a beach of sand and shingle allows of landing in fine weather. A narrow fringing reef extends on the north-east, south and west sides of the island. There is said to be a shelf off the beach, with a width of about 500 yd. and a depth of about 20 fathoms, on which anchorage may be found.

The interior of the island was formerly cultivated by people of Tokū, but the Tongan government now forbids habitation there because of its liability to volcanic eruptions (p. 29).

TOKU

Toku (lat. $18^{\circ} 09' S$, long. $174^{\circ} 11' W$) is a small island lying 12 miles south-east of Fonualei. It is low, flat-topped and wooded, with the tops of the trees about 80 ft. above sea level. The island is encircled by a fringing reef, which extends about 500 yd. to the north of it.

Toku was formerly inhabited by people from Tongatapu, who went there for refuge in time of war. When the government prohibited the use of the island as a place of residence, the people then went to live at Utulei, in Vava'u.

NIUATOPUTAPU (Fig. 30)

Niutoputapu (lat. $15^{\circ} 57' S$, long. $173^{\circ} 48' W$) is an island with an area of about 6 sq. miles, lying about 167 miles north of Vava'u. It is of volcanic formation, but shows no sign of recent volcanic activity. For the most part the surface is fairly flat, but in the centre it rises to about 350 ft. Off the north-west end of Niutoputapu is Hunganga, an islet 70 ft. high; it is separated from the main island by a boat passage which has a depth of 1 ft. at low water. A barrier reef curves round the northern side of the island, about $\frac{1}{2}$ mile offshore, and on the northward edge is Kauru'utu'u, a small islet about 20 ft. high. A fringing reef, unbroken and steep-to, protects the east side of the island from the prevailing swell.

The usual anchorage is in depths of 10 fathoms about $\frac{1}{2}$ mile west-north-west of Kauru'utu'u islet, though schooners anchor closer in. A boat channel navigable at all states of the tide leads to the settlement at Hihifo on the west side.

The island is subject to hurricanes. Water supply is mainly from rain catchment, but there is a small stream, known as Niutoua.

Discovered by De Maire and Schouten in 1616, the island was named Keppel by Wallis in 1767. The population, which is distributed among four villages, numbered 832 in 1939. Production of copra for export is the main commercial activity.

TAFahi

Tafahi (lat. $15^{\circ} 51' S$, long. $173^{\circ} 43' W$) lies 7 miles north of Niutoputapu. An extinct volcano of conical shape, with an elevation of about 2,000 ft., it has a very

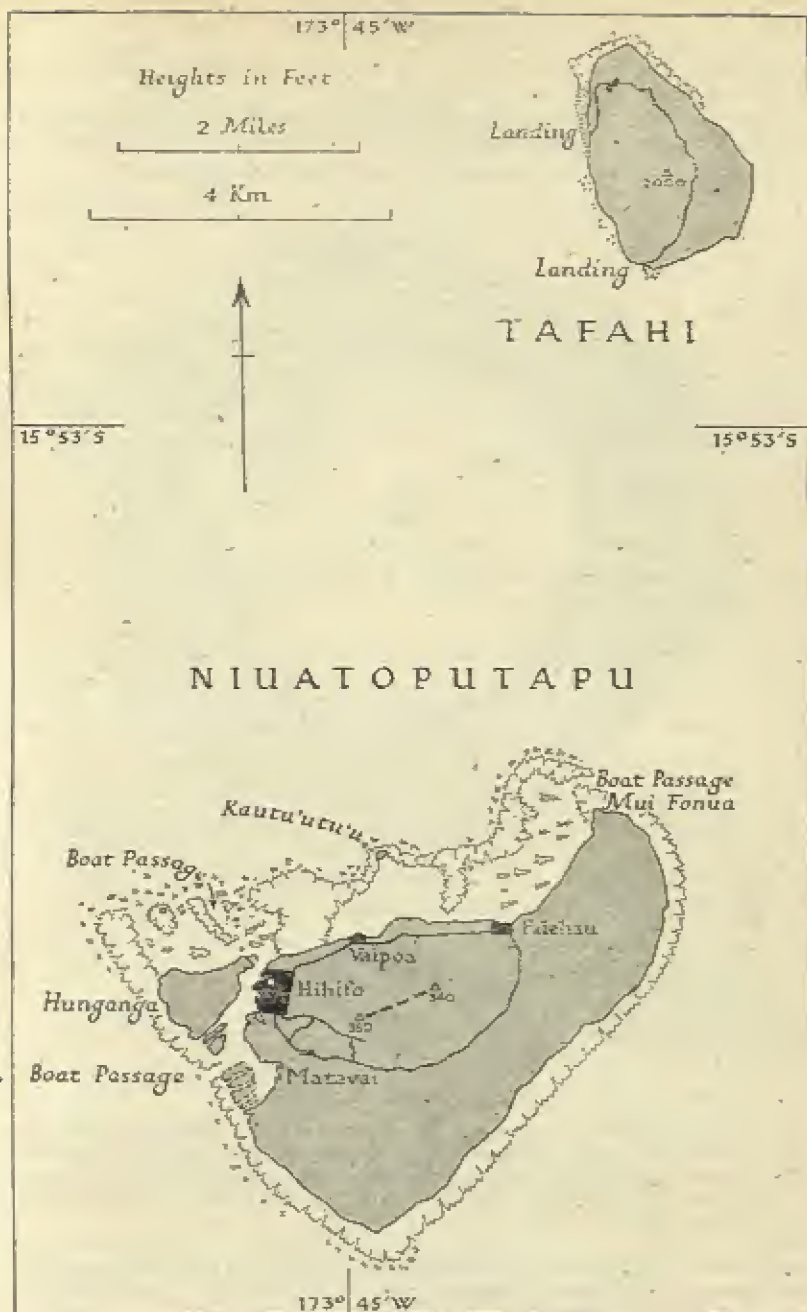


Fig. 30. Niuatoputapu and Tafahi, Tonga

The existence of the W/T station at Hihifo is doubtful. Based on: (1) Admiralty chart no. 979; (2) A. H. Wood, *History and Geography of Tonga*, p. 75 (Nuku'alofa, 1932).

rocky coast. There are two landings, the northern one being the better, though either is difficult.

The island is covered in vegetation and supports a small population (47 people in 1941) living in a single village. Tafahi was the first part of the whole Tonga



Fig. 31. Niuafo'ou, Tonga

The island is represented before the last eruption in 1943. Ahau was destroyed in 1853 and Futa in 1929. Based on: (1) Admiralty chart no. 987; (2) A. H. Wood, *History and Geography of Tonga*, p. 76 (Nuku'alofa, 1932); (3) C. S. Ramsay and C. P. Plumb, *Tin Can Island*, cover map (London, n.d.); (4) *The Volcano Letter*, no. 318, p. 1 (Hawaii, 1931).

group seen by Europeans; it was discovered by Le Maire and Schouten in 1616 and was named Boesawen by Wallis in 1767.

NIUAFO'OU

Niuafo'ou (lat. $15^{\circ} 34' S$, long. $175^{\circ} 38' W$) lies about 210 miles north-west of Vava'u. It is ring-shaped, with a large lake in the centre surrounded by a ridge of land which is cliffed on its inner side, and descends on its outer side in gentle slopes to the sea (Fig. 31). The ridge reaches its greatest height (853 ft.) on the

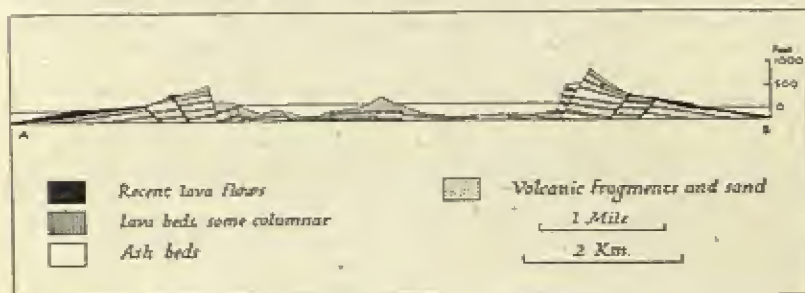


Fig. 32. Niuafo'ou, Tonga: profile structure section

Vertical scale and dip of the slopes are exaggerated twice. Note the difference in lake level and sea level. Based on *The Volcano Letter*, no. 318, p. 1 (Hawaii, 1937).

eastern side. The island is of volcanic formation and is subject to periodic eruptions (pp. 29-30). In cross-section it is composed of ash and agglomerate alternating with thin-bedded lava flows (Fig. 32). The lake is a crater sink fed by rainwater and made somewhat brackish by hot volcanic gas springs, by evaporation and

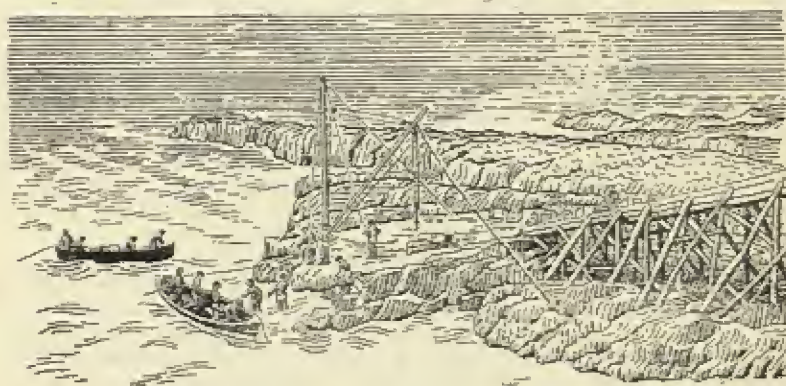


Fig. 33. Landing at Angaha, Niuafo'ou
Based on photographs.

probably by some connection with sea water. Known as Vai Lahi (Great Water), it lies 70 ft. above sea level and is about 275 ft. deep. In 1932 there were four islets in the lake.

Anchorage is possible off Angaha, on the north side of the island, but it is not good; it is better in 7-10 fathoms on the western side, about 200 yd. off the former

village of Futu. Landing on Niuafu'ou is usually difficult and can be dangerous. The coast is rocky and is commonly swept by a heavy swell. The normal landing place is on the north side near Angaha (Plate 8) on a shelf of rock where a rope secured to an anchor allows a whaleboat to be held fairly steady. A small derrick facilitates the landing of cargo, and a wooden chute from the high ground is used to bring down sacks of copra to the landing place (Fig. 33). The island is subject to hurricanes between November and May. One of great severity occurred in 1932.

The soil of Niuafu'ou is black and sandy from disintegrated lava intermixed with later volcanic ash and some humus. It is very fertile. Banana, yam and plantain are the major plantation crops; the breadfruit yields up to four crops a year (the usual number in Tonga being two). Copra is the main item of export.

The island was discovered by Captain Edwards in H.M.S. *Pandora* in 1791 and was named by him Proby island, but it was probably also the Good Hope of Schouten. In 1932 the population was 1,366, including a few Europeans. There are nine villages, of which two are on the coast and the remainder on the stretch of level land between the sea and the hills of the ring ridge. One of these, 'Alele'uta, was built to house the people who fled from Futu in the 1929 eruption.

Sea communication with Niuafu'ou is irregular. Schooners from Tonga call occasionally, and before the war mail steamers passed near by *en route* from Samoa to Fiji. For a number of years letters were carried between steamer and island by swimmers, since the sea was often too rough for canoes. The outgoing mail was wrapped in oiled paper, and the inward mail was sealed in a tin. Hence the practice was popularly referred to as the 'tin can mail', and the island as 'Tin Can Island'. The swimmers used poles of light wood of a type used by the local fishermen.

A road with a sandy surface encircles the island below and on the outer side of the ring ridge; it is used for horse and foot traffic. A track runs round the crest of the ridge overlooking the lake.

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and Geography of Niuafou Volcano', no. 318, pp. 1-3 (Hawaii, 1931)—are also valuable. A good popular account of the geography of Niuafou, including vulcanism, is given in C. S. Ramsay and C. P. Plumb, *Tin Can Island* (London, n.d.). Coasts are described mainly in the Admiralty *Pacific Islands Pilot*, vol. II (London, 1932; with supplement, 1942) and United States Hydrographic Office *Sailing Directions for the Pacific Islands*, vol. II (5th ed., Washington, 1940). No full analysis of climate has been published, but monthly figures of temperature, rainfall, humidity and barometric pressure from a few stations are published in the *Tonga Government Gazette*. The most useful accounts of vegetation are by W. Borlase Hemsley, 'The Flora of the Tonga or Friendly Islands', *Journal of the Linnean Society: Botany*, vol. XXX, pp. 158-217 (London, 1895); and I. H. Burkill, 'Flora of Vavau, one of the Tonga Islands', *Journal of the Linnean Society: Botany*, vol. XXXV, pp. 20-65 (London, 1901).

A good summary account of the history of Tonga since the coming of Europeans is given by A. H. Wood (above). Older source works include: G. Vason, *An Authentic Narrative of Four Years at Tongataboo, one of the Friendly Islands in the South Sea* (London, 1810); William Mariner, *An Account of the Natives of the Tonga Islands* (ed. by J. Martin; London, 1817); Sarah S. Farmer, *Tonga and the Friendly Islands* (London, 1835); B. Thomson, *Diversions of a Prime Minister* (London, 1894); B. Thomson, *Savage Island*, pp. 152-228 (London, 1902).

The physical anthropology of the Tongan people is examined by Louis B. Sullivan, 'A Contribution to Tongan Somatology', *Bernice P. Bishop Museum Memoirs*, vol. VIII, no. 4 (Honolulu, 1922). Tongan culture in general is described by E. W. Gifford, 'Tongan Society', *Bernice P. Bishop Museum Bulletin*, no. 61 (Honolulu, 1929); E. W. Gifford, 'Euro-American Acculturation in Tonga', *Journal of the Polynesian Society*, vol. XXXIII, pp. 281-92 (New Plymouth, 1924); Ernest and Pearl Beaglehole, 'Pangai Village in Tonga', *Polynesian Society Memoirs*, vol. XVIII (Wellington, 1941). Publications dealing with specific aspects of the culture include: E. W. Gifford, 'Tongan Place Names', *Bernice P. Bishop Museum Bulletin*, no. 6 (Honolulu, 1923); E. W. Gifford, 'Tongan Myths and Tales', *Bernice P. Bishop Museum Bulletin*, no. 8 (Honolulu, 1924); W. C. McKern, 'Tongan Archaeology', *Bernice P. Bishop Museum Bulletin*, no. 60 (Honolulu, 1929); E. E. V. Collocott, 'Tongan Astronomy and Calendar', *Bernice P. Bishop Museum Occasional Papers*, vol. VIII, no. 4 (Honolulu, 1922); and a series of papers by E. E. V. Collocott in the *Journal of the Polynesian Society*, vols. XXX-XXXIV (New Plymouth, 1921-5).

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For maps see Appendix I.

Chapter IV

GENERAL REVIEW OF THE FIJI GROUP

Physical Geography: History: Composition and Distribution of Population:
Peoples

The Fiji islands (Fig. 34) lie between lat. $15^{\circ} 42'$ and $21^{\circ} 02' S$ and long. $176^{\circ} 53' E$ and $178^{\circ} 12' W$, midway between Samoa and New Caledonia. They comprise the two large islands of Viti Levu and



Fig. 34. The Fiji group

The major reef systems are shown by a pecked line. The islands of Vatoa and Ono i Lau lie off this map, about 70 miles and 110 miles respectively southward of Kambara. Based on Admiralty chart no. 2691.

Vanua Levu; the lesser islands of Taveuni and Kandavu; and nearly 260 small islands, mostly in the Lau group, to the south-east of Vanua Levu. The total land area is approximately 7,000 sq. miles, of which Viti Levu comprises 4,053 sq. miles and Vanua Levu 2,137 sq. miles. Only about 100 of the islands are inhabited.

Politically, the group, together with the island of Rotuma (Chapter VII) about 300 miles to the north-west of the Yasawa islands, forms

the British Crown Colony of Fiji. The Governor is also the High Commissioner for the Western Pacific, and Fiji is the centre from which the territories of the High Commission are administered.

PHYSICAL GEOGRAPHY

GEOLOGY

The rocks of Fiji show more variety than those of most Pacific islands and represent a longer period of geological history. Our knowledge of them, still very inadequate, is based mainly on studies of Viti Levu (Fig. 35) and of some of the Lau islands (Figs. 36, 79). But it is evident that in most parts the rocks are predominantly of volcanic origin and that some have been formed above and others below the sea. In some areas, however, limestones of coral formation are dominant. The relation of the rocks is often complex, deposits of different types occurring in close juxtaposition.

The oldest rocks appear to be those of slaty character, known as the Wainimala series. These are found in the middle of Viti Levu, but are not known from Vanua Levu or the smaller islands. Their original nature has not yet been clearly established, but they probably represent a series of volcanic and other sediments of Mesozoic age which have been metamorphosed by heat and pressure. In places they have been invaded by magma (rock in a liquid state), which crystallized to form the granite and other coarse-grained rocks known as the Tholo series. (It has been suggested that at that time the Fijian region may have formed part of a now vanished Melanesian continent, but this view has been questioned.) The area then suffered erosion and widespread sinking, accompanied by the deposition of volcanic rocks both above and below sea level upon the eroded platform of the older Wainimala rocks. These deposits are known as the Sambeto series. Resting upon the Sambeto series are thick deposits of limestone of early Tertiary age, formed during a period of prolonged submergence. These limestones, known as the Viti formation, were overlaid in later Tertiary times by a series of fossiliferous tuffs and so-called 'soapstones' known as the Suva formation; this was the result of renewed volcanic activity which mingled ashes with the marine deposits. Finally, in Quaternary times, these deposits were all raised above the sea, and the present landscape evolved as the result of subaerial erosion.

This geological summary refers primarily to Viti Levu, but in its

later stages applies also to Vanua Levu and to Kandavu. In Tertiary times each of these latter was a chain of volcanic peaks which then constituted separate islands; but later they were united by the emergence of submarine deposits surrounding them. The uplifted marine deposits of Vanua Levu are comparable with those of the Suva formation of Viti Levu.



Fig. 35. Geological sketch map of Viti Levu

Based on H. S. Ladd, *Bernice P. Bishop Museum Bulletin*, no. 119, p. 16 (Honolulu, 1934).

Volcanic action in comparatively recent times has been responsible for the conical peak of Mbukeye Levu (mount Washington), at the western end of Kandavu, and for the structure of a number of islands. Taveuni, the only one of the larger islands with no sedimentary rocks, is entirely volcanic in origin; the mountain ridge that runs centrally along the island has four large volcanic cones, with a lake in the crater of one of them. All the Yasawa group, with the exception of Yasawa i Lau, which is possibly of elevated limestone,

are of volcanic origin, as also are Moala and the various other scattered islands between Viti Levu and the Lau archipelago. Ovalau and Moturiki, on the Viti Levu submarine platform, are surrounded by shallow water, but Moala, Totoya, Matuku and most of the others are the tops of individual volcanic cones rising from the sea floor from depths of 2,000 to 3,000 fathoms. Some have been

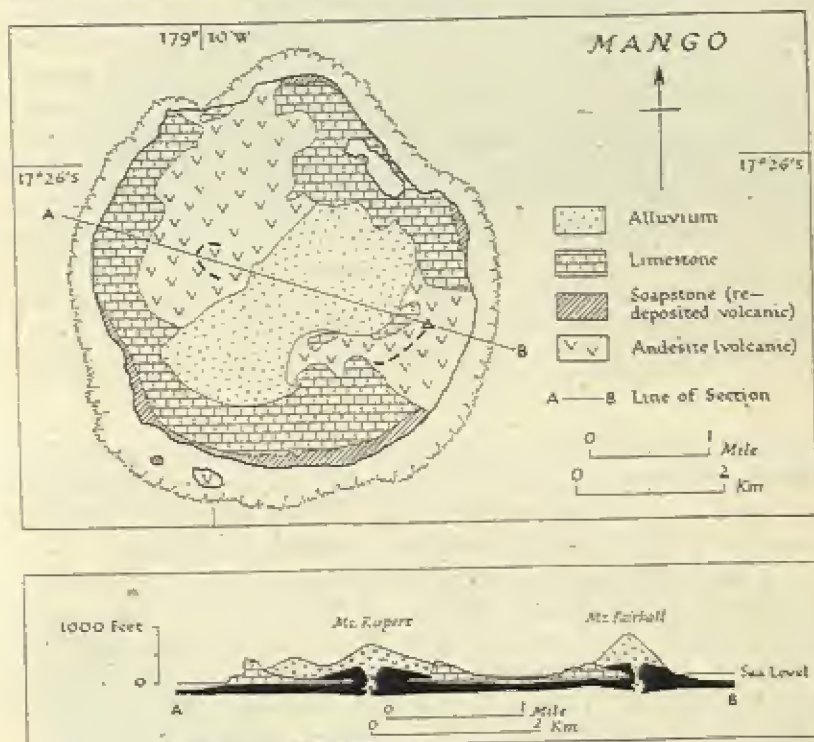


Fig. 36. Mango, Fiji: geological plan and section

Based on E. C. Andrews, 'Notes on the Limestones and General Geology of the Fiji Islands', *Bulletin of the Museum of Comparative Zoölogy at Harvard College*, vol. XXXVIII, plates 1 and 2 (Cambridge, Mass., 1900).

heavily eroded by wave action and Totoya is clearly the rim of a crater that has been breached on one side by the sea. Volcanic activity in the region has now almost entirely died away, the only evidence of it today being the hot springs of Vanua Levu and of some of the smaller islands.

Limestone formations are important throughout most of the Fiji region. They are most common as fringing reefs of recent growth,

but in some areas, especially in the Lau islands, they occur as older elevated masses. These raised limestones are often interspersed with other types of rock. The Lau islands, for instance, are composed of two main types of rock: limestones containing remains of coral and mollusca; and volcanic rocks such as diorite and olivine basalt. In origin they probably go back to Tertiary times, when volcanic material was heaped up along a north-south line of weakness in the sea bed, and islands such as Yathata, Tuvutha and Vatu Vara represented the highest points reached. Coral reefs formed around these high points, and when the land subsequently rose they became raised coral limestone, frequently in beds more than 200 ft. thick. Some of the islands show limestone formations only, either as solid elevated masses (such as Vatu Vara), or as typical atolls with a more or less continuous ring of land enclosing a lagoon (such as Fulanga). In some islands (such as Mango) the phase of elevation was followed by one of volcanic activity which burst through the limestones and threw up domes of lava and coarse agglomerates (Fig. 36).

RELIEF

The topography of the Fiji islands is varied. Detailed treatment of individual islands is given in Chapter VI, but in general character they may be described as fairly rugged, with mountains of only moderate height, many valleys and an abundance of streams.

Viti Levu (Fig. 69) and Vanua Levu (Fig. 75) possess long mountain ranges, mostly situated well inland from the coast, with many peaks from 2,000 to 4,000 ft. high (Plate 11). Extensive areas of undulating plain form part of the coastal lands. Viti Levu has also large hilly uplands (dissected plateaux) rimmed by the mountain ranges in the interior (Plate 12). In Kandavu (Fig. 77) and Taveuni the mountains form relatively simple central spines; they rise directly from the coast, so that coastal plains are small or non-existent. The drainage system of Viti Levu (Fig. 70) is elaborate, with long rivers that frequently change direction before reaching the sea. Vanua Levu (Fig. 76) has a simpler system, with shorter rivers that flow very directly from their sources to the sea. On the smaller islands, in the absence of coastal plains, streams are little more than torrents radiating from the mountain peaks.



Plate 13. Cliff on the west coast of Vatu Lele

This cliff is of coral limestone, 100-110 ft. high. It has been undercut at its base by marine erosion which has formed a terrace, now partly obscured by vegetation, and known locally as the 'great walk'.



Plate 14. Beach on the north shore of Komo, Lau islands

The rocks in the foreground are of volcanic agglomerate containing numerous large boulders.



Plate 15. Mbengga harbour

The harbour, situated on the south-east side of Mbengga island, is formed by a deep bay, with the off-lying islet of Monuriki protecting its entrance. It provides sheltered anchorage for small craft.

COASTS AND ANCHORAGES

The variety of size, shape and formation of the islands makes it difficult to generalize about their coasts. Fringing coral reefs are common everywhere except on part of the coast of Taveuni and in the neighbourhood of river mouths and deltas on the main islands. Most small islands have also a barrier reef, the same reef frequently enclosing several neighbouring islands. A vast barrier reef to the north-west of Viti Levu and Vanua Levu stretches round the outer border of the submarine platform; it is known as the Great Sea reef (Fig. 34). There are several complete circuits of reef which do not enclose any land, or surround at most a few uninhabitable rocks. A good example is Mbukatatanoa, known also as the Argo reefs, in the Lau group. Few of the reefs dry out at low tide.

The coasts themselves are very varied in height and in degree of indentation (Figs. 73, 74, 82, 83; plates 13, 14, 15, 34). The narrower bays generally have sandy beaches at their heads but are frequently choked with coral. Taveuni has the least indented coastline, while Kandavu at the other extreme has almost land-locked bays. Viti Levu and Vanua Levu both show considerable variety, from the almost unbroken south coast of the former to the deeply indented north-east coast of the latter. Further contrasts are provided by the precipitous cliffs of parts of Kandavu and the low-lying mangrove swamps and alluvial flats of the Rewa delta area of Viti Levu.

Anchorage are fairly numerous and are well distributed round the coasts of the main islands; many of the smaller islands also have at least one of value. As a rule these anchorages occupy a channel or lagoon between the shore and the barrier reef; the entrance passages are frequently opposite the mouths of rivers. Such anchorages are well protected in most weathers. Others, fairly open, are roadsteads at the mouths of the main rivers (such as the Rewa or the Mba) or merely on an open coast near European plantations (as on the south-east coast of Taveuni).

CLIMATE

Since Fiji lies well within the tropics and is surrounded by a large expanse of ocean, its climate is of maritime type; the coasts are washed by the warm equatorial current.

For most of the year the prevailing winds are from the east or south-east. Fig. 37 records the winds at Suva during 1936. As the morning winds are affected by the land breeze, their prevailing direction at 0800 hr. is north to north-east. During November,

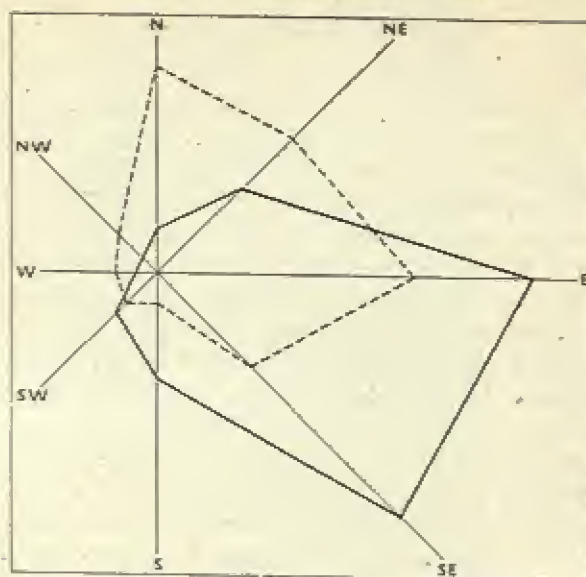


Fig. 37. Winds at Suva, 1936

The proportion of wind from the different points of the compass is shown by the distance between the perimeter of the polygons and the point of intersection of the axes. The pecked line shows winds at 0800 hr.; the solid line winds at 1400 hr. Based on R. A. Derrick, *The Geography of the Fiji Islands*, p. 156 (Ndavuilavu, 1938).

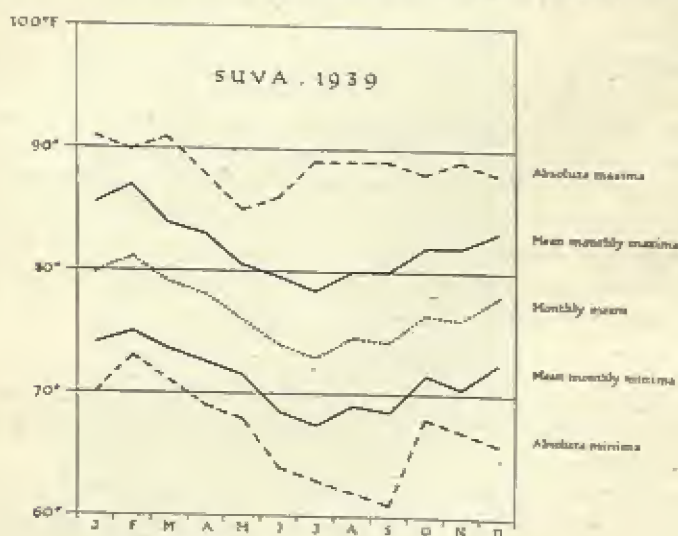


Fig. 38. Monthly temperatures, Suva, 1939
Based on data in *Fiji Blue Book for 1939* (Suva, 1940).

December and January, Fiji experiences low pressure and calms or light variable winds; thunderstorms accompanied by heavy rains are frequent, while the north-west monsoonal winds occasionally culminate in violent cyclonic storms commonly known as hurricanes. These, with winds of 75-100 miles per hour, do much damage to crops, boats and the flimsier type of building, but they are less dreaded now that news of their approach is received by wireless telegraphy and emergency measures can be taken in time. On the average, they affect the group seriously much less than once a year.



Fig. 39. Rainfall at selected stations, Fiji

The scale can be gauged from that for Nandariatu, where the second column (for February) represents 27 in. Averages for most stations shown are from statistics covering periods of 20 years or more. Based on data in *Fiji Blue Book* (Suva, 1940).

There is little difference between temperatures at sea level on the windward and leeward sides of the main islands. The monthly figures for Suva (Fig. 38) are therefore typical of those for all low-lying stations. Temperature on the coast seldom rises above 81° F. (in February) or falls below 73° F. (in July). Temperatures at hill stations are appreciably lower; at Nandariatu (over 2,000 ft. above sea level) it is nearly 10° F. lower than on the coast.

Rainfall is heavy, mostly in the form of prolonged showers,

which on the larger islands frequently fall in the afternoon. The greatest daily fall ever recorded was 26.5 in. Fig. 39 shows the average monthly rainfall at 18 stations. Considerable local variations are revealed. With few exceptions (which can gener-

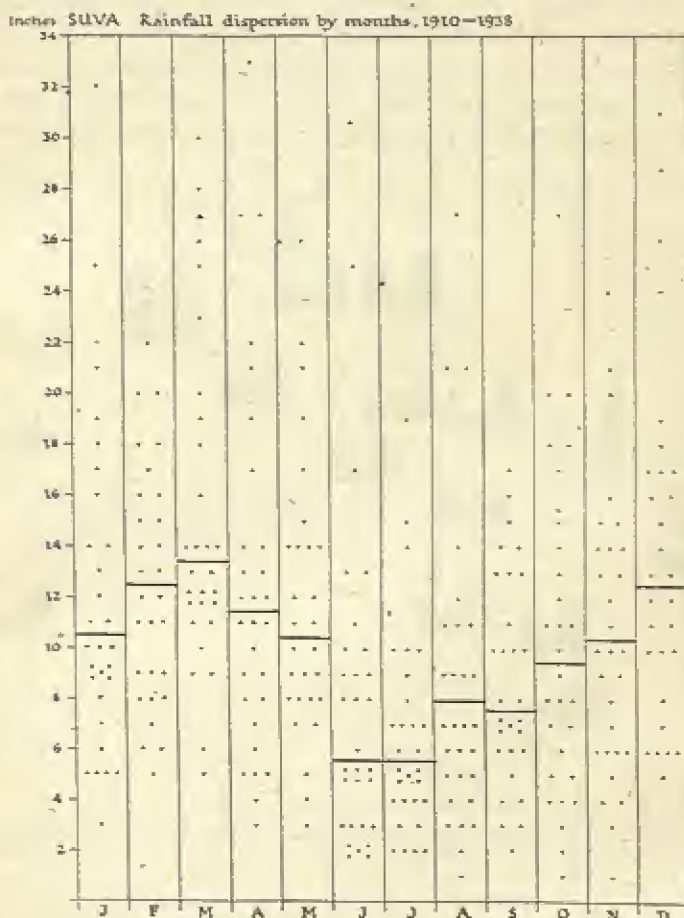


Fig. 40. Rainfall dispersion by months, Suva, 1910-38 -

Based on data in *Fiji Blue Book* (Suva, 1911-39).

ally be explained by altitude) most of the stations with heaviest rainfall are located on the windward sides of the main islands —i.e., on the south and east of the mountain ranges. But the north-westerly winds of November, December and January, coming across the equatorial seas, are heavily moisture-laden. Striking first

the north-western slopes of the main islands, they deluge these otherwise relatively dry areas with rain in this season (as at Nandativatu).

The variation from year to year in the figures of monthly means for Suva is shown in Fig. 40, while Fig. 41 gives the annual totals for that station for a long period.

Humidity is not particularly high for an oceanic climate. On the windward sides of the larger islands it averages 72 per cent., though frequently it rises for short periods to 95 or 100 per cent.

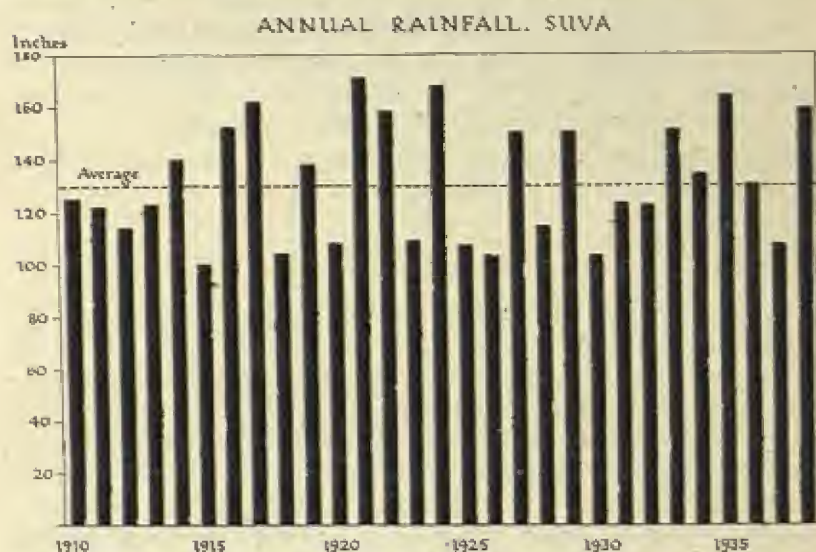


Fig. 41. Annual rainfall, Suva, 1910-38

Based on data in *Fiji Blue Book* (Suva, 1911-39).

Pressure is relatively uniform throughout the year. In 1939 at Suva it ranged from a minimum of 1,006 mb. in January to a maximum of 1,016 mb. in September, the average for the year being 1,012 mb.

In consequence of the heavy rainfall, water is abundant on all the larger islands; catchment areas and reservoirs have been established to serve the largest population centres (pp. 214-19). Only on some of the small limestone islands where rainfall is relatively low and the soil is very porous is there any shortage. A few water holes there provide brackish water, and in recent years the government has erected concrete reservoirs.

SOIL

As the underlying rocks include such different types as basalts, coral limestones, 'soapstones' and alluvial deposits, the soils derived from them vary considerably, from the very sandy deltaic soils of the Lauthala bay area to the red clays of the Suva neighbourhood. The igneous rocks of the mountains also tend to form lateritic soils of a heavy type. Much of Taveuni has a three-foot layer of rich soil derived from volcanic rocks. A type of black soil derived, like the red clay, from the 'soapstones' of the Suva formation is very fertile. It has a fair proportion of lime, a high nitrogen content and a moderate potash content. Other Fijian soils are generally slightly acid. As in most damp tropical countries, the luxuriance of vegetation does not necessarily indicate a high degree of fertility everywhere.

Soil erosion has not so far been serious, since few of the steep mountain slopes have yet been cleared of forest.

VEGETATION (Fig. 42)

The flora of Fiji is broadly speaking Indo-Malayan, and the majority of the plants are either identical with, or nearly related to, species found in New Guinea and the other islands to the north-west, as well as in Tonga and Samoa.

On the sea beaches the vegetation consists of herbaceous plants, shrubs and grasses, similar to those on the other 'high' islands of the Western Pacific. Further back this low-growing vegetation gives place to a strip of beach forest or to scattered trees and bushes which are common to most parts of the Pacific. They comprise mainly coconut, *Calophyllum inophyllum*, *Barringtonia*, *Thespesia populnea*, *Cordia subcordata*, *Scaevola frutescens* and *Hibiscus tiliaceus*.

Mangrove swamps form narrow strips in sheltered places on many parts of the coast; and in the deltas of the Mba and Rewa in Viti Levu and the Lambasa in Vanua Levu they spread out and cover a considerable area (Figs. 71, 72). A curious feature of the Fijian mangrove swamps is that both the Asiatic *Rhizophora mucronata* and the American *R. mangle* grow in them together. The mangrove forests, which cover about 48,900 acres in the group, are of considerable local economic importance. *Bruguiera gymnorhiza* provides a good timber, and *Rhizophora* with its stilt roots makes good poles for house building, fishing stakes, etc. But the main importance of

the mangroves is as a source of firewood: in Suva the fuel for domestic use and for bakeries and other industrial purposes is almost entirely mangrove wood.

The most striking feature of the inland vegetation of Viti Levu and the other islands is the sharp contrast between the wet and windward side, much of which is covered with evergreen rain forest (about 2,300,000 acres in the whole group, of which rather more than half is in Viti Levu), and the dry, mainly treeless leeward side, the *talasinga* (or sunburnt land), as the natives call it.



Fig. 42. Vegetation of the main islands, Fiji.

The open grassland is commonly known as *talasinga*. Some islands have been left blank owing to insufficient data. Based on: (1) R. A. Derrick, *The Geography of the Fiji Islands*, pp. 73, 105 (Nдавуйеву, 1938); (2) G.S.G.S. map no. 4295 (Cassini's projection)—for mangroves.

The rain forest extends to the tops of the highest mountains, though much has been destroyed and much cultivated and allowed to revert to secondary forest. At first sight the Fijian rain forest looks like that of Malaya and the Indonesian islands, but the number of species of trees in it is much smaller. It consists mainly of a mixture of broad-leaved evergreen trees, but at higher altitudes conifers become more and more common. Here and there, especially high up, *Metrosideros*, like the New Zealand *rata*, makes a splash of crimson in the prevailing sombre green when in flower.

Many species of trees are equally abundant from sea level to 3,000 ft.

The undergrowth is not very dense and in most places the forest is easy to penetrate. Among characteristic plants of the undergrowth are a small species of pandanus and a fern with short trunk and giant fronds. Epiphytic ferns, orchids and woody lianas are common.

With increasing altitude the forest becomes less tropical in character and eventually changes to montane rain forest. On the ridges at about 3,000 ft. the trees become much lower and more gnarled; epiphytes become much commoner. At 3,500 ft. there is a low mist forest in which the trees are covered with soaking masses of moss. Orchids and many other strange and beautiful plants grow in these mossy forests of the summits.

The *talasinga* country of the lee side of Viti Levu consists largely of rolling grassland covered with a dense growth of the reed-like *Miscanthus japonicus*. The native paths run like tunnels through the tall grass. Thickets of drought-resistant trees such as casuarina are scattered here and there and in places the scene is brightened by the gladiolus-like flowers of *Phaius*. The Fijians frequently burn these grasslands, and it is possible that originally they were all covered with woodland.

The rain forests of Fiji contain no timbers of outstanding merit, but there are some good hardwoods and a few softwoods. The most useful timber trees include, among conifers, the Fijian kauri pine *Agathis vitiensis* (which may form up to 35 per cent. of the stand by volume), *Dacrydium* and two species of *Podocarpus*; and among the broad-leaved trees, two species of *Calophyllum*, *Guettarda speciosa* (which produces a very durable white-ant-proof wood) and *Intsia bijuga* (which is in increasing demand for house building). The timber volume per acre is much below that in normal rain forest.

Much of Viti Levu is covered with introduced weeds, many of which are of American origin. The road from Suva to the Rewa river passes interminable thickets of 'wild lemon' (*Citrus*), guava and lantana. The fruits of the guava are distributed mainly by mynahs and bulbuls. Efforts are being made to check the spread of lantana by introducing insect enemies which eat the fruit and flowers. Other weeds which have become serious pests are the Mile-a-minute (*Mikania scandens*), Koester's Curse (*Clidemia hirta*) and, in the cane fields, the Johnson grass (*Sorghum halepense*), which was originally introduced about 1895 as a fodder plant. The last is kept

in check only by the constant vigilance of the Colonial Sugar Refining Company.

Vanua Levu shows the same sharp contrast between the vegetation of the wet and dry zones. In the wet zone there is rain forest in which *Gironniera celtidifolia* is the dominant tree below 2,000 ft. On the summits the forest gives way to compact gnarled bushes of *Metrosideros*, *Tristania*, *Sideroxylon*, etc. In the dry zone there are miles of *Miscanthus japonicus*, with thickets of candlenut, *Phyllanthus*, *Alphitonia*, etc. The smaller islands of Kandavu, Taveuni and Koro are similar to Viti Levu and Vanua Levu in their vegetation, though the flora is not so rich in species. In Moala the vegetation is like that of Koro and the neighbouring islands, except that the summit of the island is an open plateau covered with sedges, bracken and shrubs. Here and there are casuarina and other small trees. Part of the plateau is marshy, with deep pools surrounded by thickets of *Pandanus odoratissimus*.

In Kambara and Fulanga, which are limestone islands, the vegetation is somewhat different. The former has forests of large trees, including the useful *Intsia bijuga*. On the small limestone islets in Fulanga lagoon the graceful *Pritchardia pacifica*, a palm peculiar to Fiji, is a striking feature. On Vanua Mbalavu, which consists partly of volcanic rock and partly of upraised limestone, the flora of the limestone part is botanically interesting, a characteristic feature being the way in which a dense vegetation of trees and shrubs gains a foothold even where soil is almost completely lacking.

FAUNA

The fauna of Fiji, like that of most Pacific islands, has suffered considerable changes since the coming of Europeans, especially through the introduction of new species. The indigenous fauna has many points of interest. Land mammals native to the area are scarce; they comprise five species of fruit bat, and possibly, a rat, though the latter, like the pig, may well have been introduced by human agency. There are few kinds of reptiles—about ten species of snakes, all non-venomous; a chameleon and four other species of lizards. One of these, *Chloroscirtes fasciatus*, is over 2 ft. long and of a beautiful green colour. Three species of turtle occur in Fijian waters.

Birds are well represented, in numbers and in variety of kinds. Including introduced birds and migratory birds there are at least

115 species, of which about 100 are indigenous. This abundance is due probably to the well-developed river systems of the larger islands. The mongoose, however, which was introduced to combat the rats, has played havoc with the ground-nesting birds. Types of birds include owls and kingfishers and, among birds of prey, an eagle-hawk, two species of harriers, a black falcon and a goshawk. The variety of honeyeaters is noteworthy: they range from a tiny species about the size of a humming bird to one over 11 in. long. Many of the birds, such as the flycatchers, are brightly coloured, but most brilliant of all are the various kinds of parrots, parakeets, and fruit pigeons, which are often remarkable for their iridescent plumage. Ducks were once abundant, but European hunters and the mongoose have greatly lessened their numbers. The shore birds are mostly migrants.

Insect life is abundant. Mosquitoes are common, but do not include the malaria-carrying *Anopheles*.

Introduced fauna includes some Indian birds such as the mynah and the bulbul, and several Australian birds, and also domestic ducks and fowls. Pigs, probably introduced by native voyagers not long before the arrival of the first Europeans, are common in every village, and cats, dogs, sheep, cattle and horses have been introduced by Europeans (pp. 205-6).

HISTORY

Discovery

At the end of the eighteenth century Fiji was still largely uncharted. In 1643 Tasman had sighted the north-eastern part of the group, including Taveuni and parts of Vanua Levu, which he named the Prins Wyllem's islands. But the importance of his discovery was not recognized. From this time Fiji remained unvisited for over 130 years, until in 1774 Cook discovered the isolated island of Vatoa. The first navigator to pass through the centre of the group was William Bligh in 1789, in the open boat in which he and his companions had been turned adrift by the *Bounty* mutineers. He visited Fiji again in 1792. In these two voyages he sighted nearly all the more important islands. Only minor discoveries—such as that of Vanua Mbalavu in 1797 by the mission ship *Duff*, or of Ono i Lau by Bellingshausen in 1820—remained to be made. Another half-century passed before the islands were regularly surveyed. Long before that traders had penetrated the group's reef-strewn waters.

It is they, rather than the explorers, who opened Fiji to Western enterprise.

The Sandalwood Trade

For centuries Europeans in the East had been trading in 'the scented sandalwood'. Supplies were limited and the price was high. European visitors to Tonga learnt that somewhere in Fiji sandalwood was growing, but for long no one knew where. Then in 1801 a Sydney trading vessel, forced into Fiji to undertake repairs, anchored at Mbua bay in Vanua Levu and found that sandalwood was growing there. For five or six years the location of 'Sandal Wood Island' remained a close secret. But in 1807 a rush began. Many ships were sent from Sydney, and others from America and India; Vanua Levu and many of the surrounding islands were searched for supplies. Sailors who had left their ships began to act as intermediaries between the Fijians and the Europeans, and soon a regular procedure for the trade was built up. The wood was cut by the natives and brought to the sea coast or the bank of a navigable stream, where it was bartered for iron tools or scrap, muskets and ammunition, whales' teeth and other articles in general demand.

But there were also less desirable methods of obtaining the wood. Help was sometimes given in native wars in return for it; and intimidation and deceit were used. Fijians then became increasingly less anxious to trade, and Europeans went ashore in growing fear for their lives. Along with the diminution of supplies, this mutual ill-feeling became a major factor in bringing the trade to an end. The last two voyages were made in 1813 and 1814. Both led to serious disputes, resulting in bloodshed with loss of life to both sides.

The Coming of the Missionaries

For over ten years Fiji remained undisturbed by European visitors. Then in the late 'twenties trading vessels began to return; and shortly afterwards another European influence began to make itself felt. In 1830 Tahitian native teachers of the London Missionary Society were landed in the Lau group, where they were joined five years later by European Wesleyan missionaries from Tonga. Something was already known in Fiji of the work of the missionaries elsewhere. In 1835, before they had even seen a missionary, the people of Ono i Lau decided, after an epidemic had carried off many of their number, to seek the protection of the new god Jehovah.

But this was exceptional; nearly everywhere else the struggle to convert the people was long and arduous. The native teachers sent out from the early mission centres were often stoned, nearly starved and frequently driven from their homes, and many times the European missionaries who followed them retired from advanced stations in anticipation of trouble.

Compared with Hawaii, Tahiti, or even Tonga, Fiji was backward. Native society still held together against European influences, and there was dislike of a creed the adherents of which refused to take up arms in local wars. But the manifest wealth of the Europeans, the power of the guns carried by their warships, the medical knowledge of the missionaries, and the steady growth of commerce, proved too strong an argument in the end. Ma'afu, the Tongan, whose influence in the eastern part of Fiji was rising rapidly, had become a Christian before emigrating from his own country; Tui Nayau, of Lakemba, was converted in 1849; and—the greatest victory of all—Thakombau of Mbau, the most powerful chief in all Fiji, accepted Christianity in 1854. The decisive victory of Thakombau's forces, supported by those of the Christian King of Tonga, over a heathen army at the battle of Kamba in 1855 was the turning point in the history of the Fijian mission. Mass conversion followed, and only the people of the isolated mountain districts of Viti Levu remained unaffected. Within a year or two over two-thirds of the population was accounted as Christian; shortage of teachers, rather than the antagonism of those who remained heathen, set a limit to the further expansion of the church.

Naval Visits

Before 1835 the only naval vessels to visit Fiji had been those of the explorers Bligh, Bellingshausen and Dumont d'Urville. After that time they called much more frequently, often spent much longer in the waters of the group, and occupied an increasingly important part in the relations between Europeans and Fijians. They settled outstanding disputes between their nationals and natives, and they performed hydrographical work.

The first chart of Fiji with any approach to accuracy had been that published in London by Arrowsmith in 1814. It had shown fairly correctly the 'Sandal Wood Coast' of western Vanua Levu and the reefs and islands passed by the sandalwood ships, but elsewhere it was grossly erroneous. The first systematic survey of the entire group was made by the ships of the United States Exploring Expedition, under Captain Charles Wilkes, in 1840. The expedition

spent four months in Fiji, and the results represent a splendid achievement. The work of amplifying and correcting Wilkes's charts has been performed principally by British officers, from Captain Mangles Denham in 1855-6 down to the present time.

The Trade in Bêche-de-Mer

At the time of Wilkes's visit the trade in *bêche-de-mer* was reaching its highest point. This trade had been begun by the Americans about 1827. Its principal centre was the north-west coast of Vanua Levu, where the reefs were particularly rich. On arrival a trader made an agreement for labour with a local chief. Then buildings were erected—a pot house (for boiling the fish), a batter house (for drying it after cooking), and a trade house (for storing muskets, cutlasses, iron tools and other articles of barter). An army of workers went out to the reefs, and for six or eight hours' labour earned a hoop-iron chisel or a few beads. This continued for some months until the ship had obtained a full cargo.

Success depended upon the ability of the trader to maintain good relations with his native workers, and a reliable interpreter was invaluable. About 1835 a few Europeans settled at Levuka, on the island of Ovalau, and at first made their living by serving in this capacity upon visiting ships. Later they built small cutters, traded on their own account in *bêche-de-mer* and 'tortoiseshell', and established a new trade in coconut oil. On the domestic side this settlement was unusual in the Pacific. Scarcely any of its members had brought European wives to the islands, yet they contrived to maintain higher standards of order and comfort than were commonly found when white women were absent. As a result their half-caste children began to play a significant part in the further advance of Western influence in Fiji. They served as sailors and traders and acted as navigators and interpreters on ships from overseas. Levuka has been ever since the centre of a considerable and relatively progressive mixed-blood community.

Thakombau and Ma'afu

The decline of the *bêche-de-mer* trade after about 1855 was caused by the unsettled state of Fijian society. As in most other parts of the Pacific, the coming of Europeans had brought about a gradual modification of the older tribal system of government. Able chiefs, with the help of European weapons and often of Europeans them-

selves, had begun to extend their sway over neighbouring communities.

The islet of Mbau, off the south-east coast of Viti Levu, had first become important when Thakombau's ancestors had occupied it in the middle of the eighteenth century. In 1803 a very able man, Naulivou, succeeded to the office of *vunivalu* (war chief) of the island. He persuaded a number of European sailors to settle under his protection, and one of them, Charles Savage, a Swede, performed great deeds with the only musket then in the hands of either of the opposed forces. He had a sedan-chair made of plaited sennit, in which he was carried into musket range of the enemy's positions, and from which he picked off their sentinels until the garrison fled. Before long many tribes possessed muskets, but the people of Mbau, from their close association with Europeans, maintained their advantage. The coastal villages opposite Mbau were early subdued, then the islands of Lomaiviti were absorbed, and gradually Mbau influence spread round the coast of Viti Levu as far west as Mba and entered eastern Fiji in Taveuni and Lau.

The death of Naulivou in 1829 checked this advance, but with the rise of Thakombau about ten years later another great period of conquest and successful intrigue began. In Viti Levu the powerful state of Rewa was sacked, while in eastern Fiji Somosomo was assisted to conquest of territories forming the present province of Thakaundrove. By 1850 Thakombau had begun to be addressed by foreigners as Tui Viti (King of Fiji).

But Thakombau's ambitions were beginning to imperil the stability of his position. In 1851 he ordered a levy of *bêche-de-mer* throughout his dominions to pay for two vessels he had ordered; such a demand found no sanction in native custom, and it was contemptuously refused. Gradually, too, old obsequious chiefs who had accepted his victories gave place to younger men eager for renewed independence. Rewa revolted, and was soon joined by the coastal villages of Viti Levu from Kamba to Namena; the island of Ovalau reasserted its independence; and disaffection spread to many of the chiefs of Mbau itself and to Thakombau's personal serfs. The white settlers of Levuka also were on the side of the rebels. In battle Thakombau's forces were repeatedly defeated. In this extremity he decided on 28 April 1854 to embrace Christianity. The immediate result was a further extension of the rebellion. But his fortunes began to turn. An American vessel sold him arms; the chief of Rewa died; and as the final stroke of good fortune King Siasia (George) Tupou

of Tonga, a Christian, visited him with a strong force of warriors. In April 1855 the two hostile alliances met at Kamba. The Tongans with their fine discipline and novel tactics turned the battle into a rout. Rewa and its allies were finally defeated.

This victory cleared the ground for the final struggle between Thakombau and Ma'afu. The latter, a son of King Siosaia (Josiah) Tupou (Aleamotu'a, Tu'i Kanokupolu) of Tonga, had come to Fiji in 1848. He built up a considerable army from Tongans already settled in eastern Fiji and from later immigrants, and used his influence to undermine the position of Tui Nayau, supreme chief of Lakemba, and other chiefs of Lau. The battle of Kamba, in which he had allied himself with King George in support of Thakombau, marked his entry into the affairs of western Fiji. He turned to account the increase in Tongan prestige which resulted from it by systematic intervention in tribal quarrels throughout the group, and was able within a few years to make himself the greatest power in the land. Thakombau watched with growing anxiety; the missionaries continually expected the outbreak of general war; and the settlers feared a total disorganization of trade.

The Coming of Pritchard as Consul

At this stage W. T. Pritchard arrived in Fiji as the first British consul. Since he believed that Fiji had an important future as a producer of a great variety of tropical commodities, he desired to see its annexation by Britain. He therefore set himself the task of bringing this about, and of maintaining peace and order during the intervening period.

He found Thakombau, who was troubled by claims for reparations being made on behalf of American citizens, amenable to the proposed cession. A formal offer was made in October 1858 and the consul sailed for England at the beginning of November in the hope of persuading the government to accept it. He returned a year later, and at a meeting of chiefs which he convened at Levuka he obtained confirmation of the offer of cession and the grant to himself of the necessary powers. The task ahead of him was formidable; for though he had brought the rivals Ma'afu and Thakombau together at Levuka, their underlying enmity was undiminished. Nearly all Fiji was involved in the network of intrigue which they had created. Not even traders or missionaries had been able to avoid taking sides. With extraordinary patience and skill Pritchard gained a knowledge

of most of the secret and often conflicting alliances and prevented any serious outbreak of war.

The principal work of the consulate, however, lay in its attempt to control the European community. Encouraged by the possibility of cession, many new settlers were arriving from Australia and New Zealand. At Levuka grog-shops began to spring up, and in many parts of the group settlers were buying land. Regulations for registration of land titles and for other purposes had to be drawn up and methods for enforcing them devised. The consulate staff was increased, a 'Mercantile Court' was formed at Levuka (with the support of the American commercial agent and of leading settlers), and a small cutter was maintained to enable the consul to visit the missionaries and planters scattered throughout the group. Late in 1861, however, the British government decided against annexation and recalled Pritchard.

The Progress of European Settlement

Until 1860 the European community in Fiji comprised missionaries, traders and beachcombers, and numbered probably under a hundred members, excluding half-castes (who were probably between one and two hundred). The increase which took place after 1860 represented a new class of settlers, and the beginning of an economic development of basic importance.

The activities of the Manchester Cotton Supply Association and other bodies had drawn attention to the possibilities of South Sea islands as centres of cotton production.

The enthusiastic reports on Fiji—notably those of Dr Berthold Seemann, who was sent out by the British government to report on the subject—seemed to show that the group was peculiarly suited to the crop. The great rise in price which followed the outbreak of the American Civil War provided ample incentive to intending settlers, even after the prospect of British annexation receded. The European population increased to over 300 by 1865 and reached 2,000 in 1870.

By then Levuka, with a permanent European population of several hundreds, besides a constant stream of settlers and intending settlers passing through it, possessed important business houses which catered for all the needs of the planters (including the supply of credit). There were also numerous hotels and taverns, a newspaper, and several churches (Plate 10). Elsewhere (notably at Rewa) there were embryo townships and well-stocked traders' stores.

Cotton plantations were scattered throughout the islands, especially in Taveuni (over 100) and in the Rewa district of Viti Levu (between 60 and 70). But many of the best individual plantations were in more isolated parts, as on the island of Mango, in northern Lau.

A notable consequence of this increase in European settlement had been the rapidly growing demand for native labour. This was supplied in part by the Fijians. By 1870 probably about 2,000 of them were working on plantations. Only in Lau and Taveuni, however, for which they were recruited in the relatively distant Viti Levu, were they regarded as really satisfactory. In other areas it was usually possible for them to make their way home when they tired of work. For this reason the planters had early begun importing men from other parts of the Pacific. Between 1864 and 1868 over 1,000 labourers were brought into Fiji, nearly all from the New Hebrides. As the traffic increased other areas—notably the 'Line Islands' (as everything between the Marshalls and the Tokelau group was designated) and the Solomons—were drawn upon.

The Government of Fiji

The problem of Fijian government was becoming of increasing importance. After 1860 rivalry of Thakombau and Ma'afu was less active; but new and more complex problems resulted from the influx of European settlers and of 'foreign' labour. After about 1867, forced by circumstances, the British acting-consul, J. B. Thurston, was exercising powers scarcely less wide than those Pritchard had assumed eight years before.

Some form of local government was clearly necessary in the interests of all sections of the Fijian community. Between 1865 and 1870 many proposals were put forward, and some reforms were carried out. In 1869 Ma'afu formed the 'Lau Confederation', which with the help of European advisers provided a fairly effective government for the eastern part of the group. Thakombau, though faced with greater difficulties, had brought much of the native population of the western areas under the control of a rough system of law and had established a poll tax. The settlers also had promoted various schemes. Some, concerned with settler interests alone, proposed a police force to maintain order within the principal regions of white settlement and a regularly constituted authority to co-operate with the native rulers. Others envisaged a central administration, governing both settlers and natives.

The project which finally succeeded was developed without

general consultation with the settlers. The man mainly responsible for it was George Austin Woods, a retired naval officer who had come to Fiji to survey a passage through the group for mail steamers. He gained the support of Thakombau and a group of Levuka merchants. In June 1871 they issued a proclamation over the signature of Thakombau as Tui Viti, announcing the formation of a government and summoning an assembly of delegates to consider the constitution.

Many of the chiefs resented Thakombau's new claims to sovereignty, but all of them (including Ma'afu) were persuaded to give him their allegiance. The settlers were at first eager to support him. Most of the anticipated consequences—security of land tenure, cheaper credit, schemes for public works and the development of communications—were of great importance to them. Since all the ministers were members of their own community they could be certain of sympathetic treatment of their interests, and the constitution provided for a parliament in which the elective chamber was representative of the white community alone.

But settler opposition soon raised its head. There was much jealousy over public appointments, dislike of paying taxes, and criticism of the ministers and other officials. Early in 1872 the first of several revolutionary movements became active. Keyse's Hotel in Levuka was fortified by a group of men known as the 'Ku Klux', and guns were trained on the Parliament House at the other end of the town. Eventually a British warship forced the rebels to disband, but the inability of the government to deal with the situation had cost it further prestige. Within a year opposition was even more widespread. Cotton prices had fallen, and the planters were extremely hard pressed for money. They refused to pay taxes; their attitude towards the labourers they could no longer pay, and towards natives generally, became increasingly despotic; and they began to see the debts of the government as threatening their ruin. At the end of 1872 leading settlers had formed the 'British Subjects' Mutual Protection Society' to 'overturn a Usurping Ministry by Armed Force, if necessary'. In 1873 they staged a revolt in the Mba district of Viti Levu, and once again the government was forced to call in a British man-of-war. In these circumstances, the ministers relied less upon the support of the European legislative assembly and more upon that of the King and the native troops.

Meanwhile, Thurston, who had joined the government in 1872, had written to the British Foreign Office asking whether Great

Britain was prepared to annex Fiji. The query was treated as a definite offer of cession. Two commissioners were sent out, and they reported that the offer should be accepted. From this time, early in 1874, the government virtually ceased to function. In September of that year Sir Hercules Robinson, Governor of New South Wales, arrived in Fiji to determine with the King and chiefs the terms of cession. On 10 October the formal deed of transfer was signed.

The Policy of Sir Arthur Gordon

The first Governor of the new colony was Sir Arthur Gordon, a man of high ability, enterprising and unconventional. Through family connections he had influence with many political leaders at Home. In the West Indies and in Mauritius he had already distinguished himself as a fearless champion of the rights of non-European peoples. He went to Fiji concerned with saving the Fijians from the more evil consequences of unregulated contact with Europeans. He had no faith in the settler government and was prepared to build anew from the foundations. But the situation on his arrival in June 1875 was even worse than he could have imagined. An epidemic of measles had swept away a third of the entire population. The Fijians were a prey to all sorts of rumours as to the new government's intentions and as to its possible responsibility for the epidemic. The Europeans also, impoverished by the continued decline in cotton prices, were greatly disheartened. The government itself was almost without funds. It had inherited a considerable debt; its current expenses far exceeded its almost negligible revenue; and the Home government was prepared to help only by a temporary loan.

The three basic aims of the new administration were thus those of regaining the confidence of the Fijians, assisting the economic recovery of the settlers, and balancing the budget. The first aim was regarded as initially the most important. Sir Arthur Gordon's period of rule was therefore most remarkable for its native policy. The primary purpose of this policy was the prevention of 'moral shock' to the individual and of disintegration in society. Immediate adjustments were to be made, as far as possible, by the government rather than by the natives. The Fijians were not to have conferred on them the usual rights of British subjects (which in any case were only partly understood by them), but the Governor and his principal officials were to assume a place at the head of native society.

A system of native administration was worked out in accordance with this principle. Existing native institutions were developed so

as to provide a chain of authorities extending from the village headmen to the Governor. In nearly all essentials this system still remains in operation.

Closely connected with it was the system of native taxation. The impecunious government was forced to raise as much revenue as possible from the Fijians. But it was realized that a money tax would put the natives at the mercy of the merchants and planters, and a labour tax was administratively impracticable. The government was therefore thrown back upon one payable in kind. Every year the Legislative Council of the colony made an assessment, in terms of money, for each province. Tenders were then called for the purchase of commodities in which the tax would actually be paid; and the *Roko Tui* (provincial chiefs) were informed what quantities would therefore be required. Apportionment within the province was left to the native authorities. In practice many provinces paid more than the assessment. This was encouraged; any surplus was refunded and, though much of the money was undoubtedly wasted, much was spent in making useful purchases, as of boats or cutters.

The success of Gordon's methods of regaining the confidence of the people was soon proved. In 1876 the government was faced with a revolt by some of the mountain clans of Viti Levu, which had not yet been brought into contact with the government. Looking back to the sullen state of native society in the previous year many prophesied a prolonged struggle, such as that which the New Zealand government had only recently concluded against sections of the Maori. But the leading chiefs rallied solidly to the Governor; and the trouble was settled with remarkably small loss of life. This 'Little War' (as the revolt came to be known) was the last organized resort to force on any scale in Fiji.

The attitude of the European settlers towards the government was very different. They had hoped that annexation would lead at once to recognition of their land claims, to an ample supply of plantation labour, to the expansion of trade and commerce, and to the influx of fresh capital and further settlers. Instead, land claims were settled only after careful and slow inquiry; the recruiting and employment of both Fijian and 'foreign' native labour were controlled by strict regulations; and the extortionate profits of the native trade were wiped out by the system of taxation. Official action to help the settlers, such as Gordon's experiment of introducing Indian labour, was often of little use because of their poverty. The plight of many of them, as a result of their losses in cotton growing, was such that

no practicable help could have saved them; but they found an outlet for their disappointment in vilification of the Governor and his officials.

The Period of Stringency

In Gordon's time the resources of the Fijian government had always been small, but soon after his departure in 1880 things changed for the worse. Loan funds were exhausted, and the Home government refused to allow any fresh borrowing. For a time it was hoped that the newly established sugar industry would relieve the colony's major difficulties, but in 1886 sugar prices fell disastrously.

The burden of sustaining the administration finally fell on Sir John Thurston. First as consul, then as a minister in Thakombau's government, and later as Colonial Secretary, under the Crown, Thurston had been concerned continuously for over twenty years with the problems of Fijian government. He had a unique position as an authority upon native affairs. With a small staff and a total colonial revenue of little more than £60,000 in some years, he governed efficiently. Officials, from the Governor downwards, travelled among the remote villages, maintaining contact between government and native authorities, and making the latter work effectively. The functions of government had thus been reduced almost to those of maintaining law and order. There was almost no money for public works, such as roads or bridges, and very little for social services. But a solid foundation had been laid for later advance, and the recovery of the sugar industry after 1890 gave renewed confidence.

The Federation Controversy

During Thurston's administration, which was terminated by his death in 1897, the dissatisfaction of the settlers had found fewer outlets. At the turn of the century, however, there was a renewal of political agitation, the basic cause being probably the return of a measure of prosperity to the islands through the development of the sugar industry. Much of the profit of this industry went not to the planters but to the sugar refining companies. The replacement of the administration by some form of self-government under their own control thus seemed to the settlers to be more than ever desirable, in order that they could redress the economic balance.

Their programme took the form of a demand for federation with New Zealand. This demand had been raised unsuccessfully in 1885, but in 1900 the visit of the New Zealand Premier, Richard John

Seddon, to Fiji resulted in an organized campaign. The Governor, Sir George O'Brien, opposed this, but many Fijian leaders who disliked the Governor on other grounds sided with the reformers, and O'Brien was virtually recalled. In the meantime, the Fijian settlers had decided at Seddon's suggestion to make local self-government, instead of federation, their immediate objective. Upon this basis the Home government was prepared to meet them and the agitation soon came to an end.

A New Phase of Expansion, 1902-10

During the rule of the next two Governors, Sir Henry Jackson (1902-04) and Sir Everard Im Thurn (1904-10), many important reforms were introduced. These were made possible by the changed economic fortunes of the colony. In 1895 the value of sugar exported had been £208,889; in 1905 it was £539,594. The value of copra also showed a large increase. Government revenue in Im Thurn's first year of office was 85 per cent. above the figure in Thurston's last, eight years earlier.

On the constitutional side there was reform of the Legislative Council in 1904; an electoral system was introduced for the return of European unofficial members. Five years later Suva was formed into a municipality; and this change placed its administration effectively in the hands of the settler community. The most important change of all from the point of view of European residents was perhaps the abandonment of the prohibition on the sale or long lease of native land.

These reforms were expected to benefit natives as well as Europeans. Both Jackson and Im Thurn believed that, for the future, the emphasis in native policy must be less upon the preservation of native institutions and more upon the adaptation of Fijian ways of life to those of the European world of which inevitably the Fijians were becoming a part. Native taxation was reduced, in the hope of stimulating interest in production for private profit; the payment of taxes in cash instead of kind was introduced in some areas for the same purpose; and more land was opened up. At Nasinu, near Suva, a school was established for the education of the sons of chiefs. The members of the Great Council of Chiefs were persuaded to agree to a system whereby they would nominate several of their number as a panel from which the Governor could elect two as members of the Legislative Council.

The years between 1902 and 1910 thus saw the birth of modern Fiji.

Modern Fiji

The period from 1910 to the present day has seen the gradual realization of changes which were implicit in the earlier situation. The opening up of native land permitted a great extension of sugar cultivation; and the growth of this industry has entailed the final eclipse of the European planter class which had been so powerful in former times. The franchise, so laboriously won, has been of benefit principally to Europeans in the towns—traders, professional men and civil servants. The sugar industry has been primarily responsible also for the growth in numbers and in prosperity of the large Indian community. It has made out of Fiji a 'plural society' of an unusual kind, in which a great and progressive Australian company, enjoying a monopoly position, controls the major industry but works in conjunction with Indian tenant farmers; in which smaller European firms (mostly locally owned) maintain a dominant position in commerce and the lesser industries; and in which the native Fijians maintain themselves principally as subsistence farmers and as wage labourers. The significance of these changes is considered more fully in following sections of this and the next chapter.

COMPOSITION AND DISTRIBUTION OF POPULATION

The population of Fiji was 195,639 according to the last census in 1936; according to the latest available estimate, in 1941, it was 227,280. This figure includes the population of Rotuma (approximately 3,000), which has been excluded from the 1936 figures.

Composition of the Population of Fiji, 1936

Ethnic group	Number	Per cent.
Fijians	97,597	49.0
Indians	84,983	44.0
Mixed-bloods (European-Native)	4,524	2.5
Europeans	4,010	2.0
Polynesians	964	0.5
Chinese	1,751	1.0
Others	1,810	1.0
Total	195,639	100.0

Based on: Colony of Fiji, *A Report on the Fiji Census, 1936* (Suva, 1936).

The population is not homogeneous, but consists of several racial and cultural elements, of which the chief in numbers are the Fijians

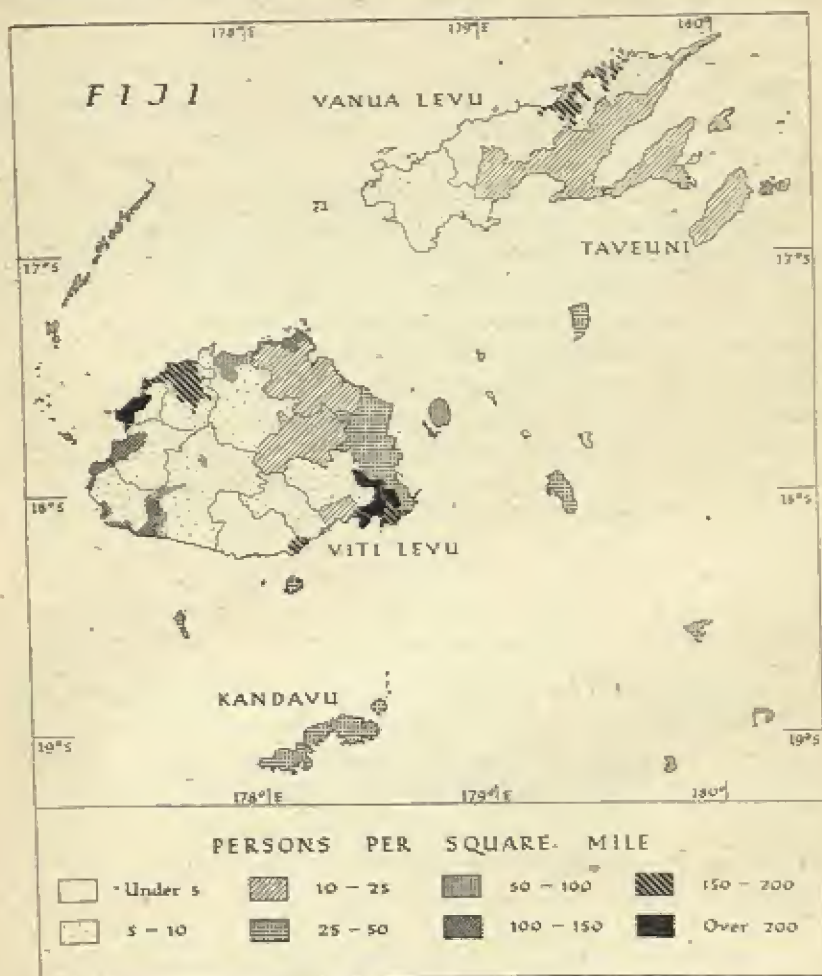


Fig. 43. Density and distribution of total population in the main islands, Fiji. Based on map no. 1 in *A Report on the Fiji Census, 1936* (Suva, 1936). Projection as in Fig. 42.

and the Indians. No complete racial or ethnic analysis of the population has been made, but a broad classification on the basis of community origins allow some generalizations to be drawn.

POPULATION DENSITY

Density of population is in general not very high, the average figure for the colony as a whole being 28 persons per sq. mile. Local differences are considerable. Fig. 43 shows the density and distribution of the total population by provinces; the density ranges



Fig. 44. Density and distribution of native Fijian population in the main islands, Fiji

Based on map no. 2 in *A Report on the Fijian Census, 1936* (Suva, 1936). Projection as in Fig. 42.

from 213 persons per sq. mile in Rewa province (due to Suva, with its population of over 15,000) down to only 9 persons per sq. mile in Namosi province.

There is also considerable variation in the way in which the different 'racial' groups are distributed. Fig. 44 gives the distribu-

tion of Fijians. It should be noted that this is fairly even over Viti Levu and Vanua Levu; the valley settlements extend right to the head waters of the rivers. Indian distribution (shown on Fig. 45)



Fig. 45. Density and distribution of Indian population in the main islands, Fiji. Based on map no. 3 in *A Report on the Fiji Census, 1936* (Suva, 1936). Projection as in Fig. 42.

reveals the concentration of settlement in the main sugar-producing areas with very little scattered settlement outside these areas.

POPULATION TRENDS

The native Fijians were estimated to total 200,000 in 1859; 170,000 in 1868; and 140,000 in 1871. An epidemic of measles in 1875 reduced them again by more than a quarter. By 1891 they were 106,000. The annual figures from that date to 1940 are given in

Fig. 46. It will be noticed that the decline continued till 1905-09, when the total fell to 87,000. From then till 1918 a slight recovery set in, but this was followed by a sudden drop to 83,000, occasioned by the influenza epidemic of that year. From 1919 until today recovery has proceeded slowly but at a gradually accelerating pace to an estimated total of 105,000 in 1940.

The Indians have grown steadily in numbers since their introduction in 1879 as indentured labourers to work the sugar plantations. From this date to 1916 the Indian immigrants averaged 2,000 per annum. About 60 per cent. came from the United Provinces, about

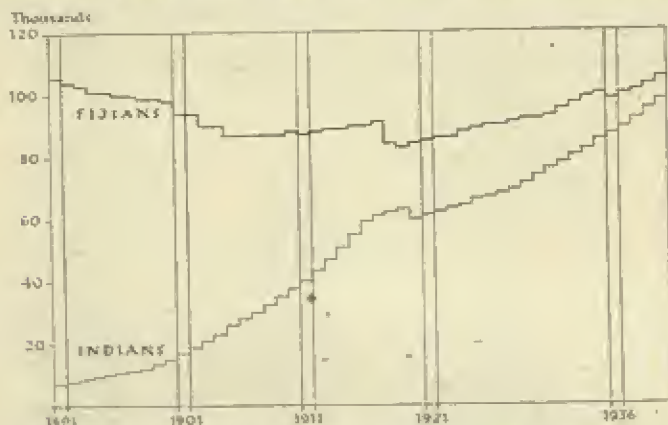


Fig. 46. Fijian and Indian population, 1891-1940

The years 1891, 1901, 1911, 1921 and 1936 were census years; figures for intervening years are official estimates. The figures for Fijians between 1921 and 1935 were proved to be over-estimates by the census in 1936; there was no actual decline. Based on: (1) *Legislative Council Paper*, no. 40, 1939 (Suva); (2) *Fiji Blue Book* (Suva, 1939-41); (3) S. H. Roberts, *Population Problems of the Pacific*, p. 292 (London, 1927).

25 per cent. from Madras and the remainder mainly from the Bombay Presidency. The growth of Indian population from 1891 to 1940 is shown in Fig. 46. Throughout the period of indentured labour the immigration rate greatly exceeded the repatriation rate. For many years the birth rate of the Indian population was greatly limited by the small quota (at first 25 per cent. and later 35 per cent.) of women among the immigrants. But the increase of population after 1921 has been due not so much to continued small-scale immigration as to the tendency of the sex-ratio to become more even.

The Europeans have always been a small group, numbering

4,824 in 1911, 3,873 in 1921 and 4,010 in 1936. The mixed-bloods (styled in the census 'persons of mixed European and Native descent') have grown rapidly in numbers in recent years—from 2,781 in 1921 to 4,524 in 1936.

BIRTH RATES AND DEATH RATES

Birth rates and death rates for the Fijian population are given in Fig. 47. It will be seen that with the exception of 1919 when the

Number per 1000 of population

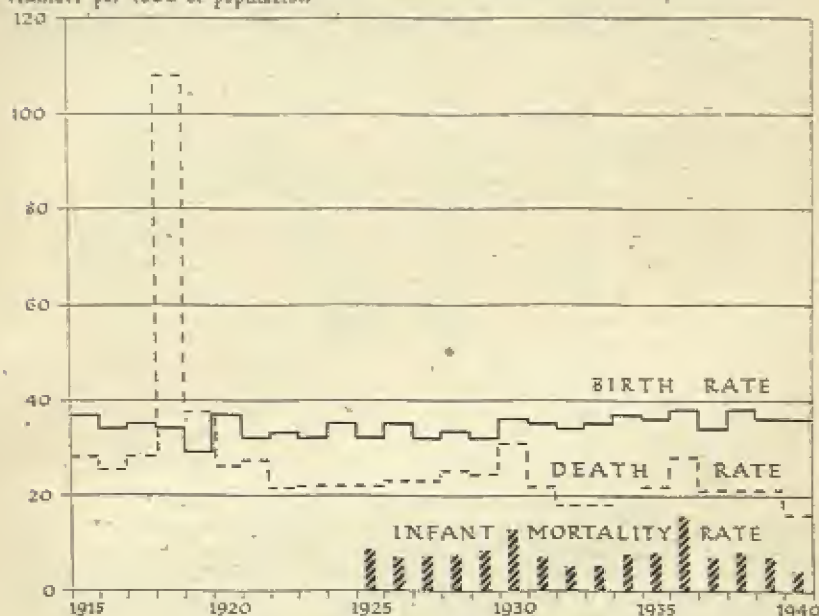


Fig. 47. Fijian birth and death rates, 1915-40

Based on: (1) *Fiji Blue Book* (Suva, 1916-41); (2) *Legislative Council Paper*, no. 40, 1939 (Suva).

effect of the influenza epidemic made itself felt, the birth rate had fluctuated between 32 and 38 per thousand with no very marked trends. The death rate, which in 1891 was 52 per thousand, had fallen to about 27 in 1915 and to below 20 per thousand in 1940. Infant mortality (i.e., that of children up to five years old) has fluctuated between a maximum of 16 per thousand and a minimum of 4 per thousand in 1940. The mortality of children under one year (rate per thousand live births) has shown a marked decline in the last decade; from an annual average of 163 per thousand in 1925-7 and

155 per thousand in 1929-31, the rate has fallen to 80 per thousand in 1939-41. This reduction by nearly one-half seems to be largely due to the infant welfare campaign begun in 1928.

The Indian birth rate has been fairly consistently higher than the Fijian rate, and this advantage has been greatly increased by lower infant mortality among Indians. Comparable figures of Indian death rates for all ages are not available for all periods, but the

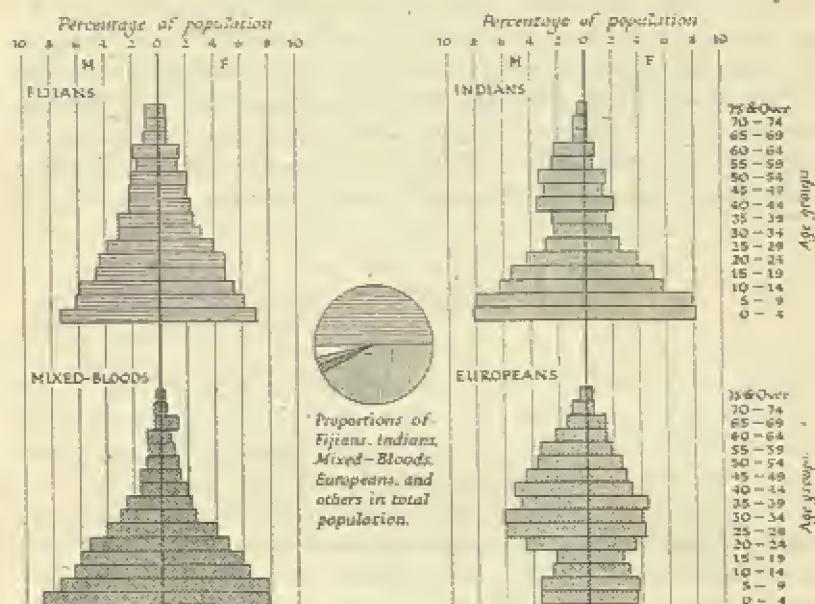


Fig. 48. Age-groups of Fijians, Indians, mixed-bloods and Europeans in Fiji. The term 'percentage of population' means percentage of each section (Fijian, Indian, etc.), and not percentage of the total population of the colony. Based on tables in *A Report of the Fiji Census, 1936* (Suva, 1936).

1940 figure of 8.15 per thousand contrasts strikingly with the corresponding figure for Fijians of 15.77.

The European birth rate from 1934 to 1938 fluctuated between 9 and 17 per thousand. Mixed-bloods show a birth rate similar to that among Indians.

AGE AND SEX DISTRIBUTION

Fig. 48 shows the age and sex distribution of the four main groups in the population. Of these, the Fijians and the mixed-bloods show the most normal distributions with sexes well balanced and a pro-

gressive diminution in size of the age groups, thus reflecting a stable population. The Indians on the other hand show a marked predominance of men in the older age groups due to the conditions of immigration of Indian labour already noted. The age groups up to thirty show an even balance of the sexes, and by the steep side of this lower part of the 'pyramid' reveal their relatively high fertility—exceeded only by that of the mixed-bloods. No such relatively simple picture is presented by the Europeans. Here, except in the age groups up to twenty, there is a definite preponderance of males. This can be explained mainly in terms of the relatively unattractive living conditions for women in a tropical territory and the few careers open to them. The marked diminution in the age groups of ten to twenty years is due to the custom of sending children between these ages to schools in New Zealand and Australia.

PEOPLES

FIJIANS

The native Fijians are an agricultural and fishing people. Their economy in pre-European days was mainly of the subsistence type, but was elaborate enough to permit of some degree of craft specialization. The advent of Europeans has meant that the Fijians have adopted a money economy and begun production for the world market. Their culture today is a complex and not very harmonious blend of traditional and European-inspired elements. In the remoter areas such as the interior of Viti Levu and some of the outlying islands less change has occurred, and conflict between ancient and modern ways is less marked.

Physical Appearance

The Fijians are the most easterly representatives of the Melanesian physical type (Plate 16). Being near Tonga, there has been some admixture of Polynesian blood, particularly in the Lau islands. The bulk of the population is typically Melanesian with an average stature of 5 ft. 7 in. (171 cm.) in the case of men and 5 ft. 2 in. (159 cm.) in the case of women. Their skin is dark, ranging through shades of chocolate to almost black in the inhabitants of the interior of Viti Levu. Their heads are of medium width (the cephalic index averages 81.5). The percentage proportion of breadth to length of the face is 84.7, a similar ratio to that of Polynesians. But the latter rarely

have the broad nose and long frizzly hair of the Fijians—hair which the latter sometimes bleach with lime or colour red with dye from the bark of a tree.

Language

As one moves from east to west across the Pacific one passes out of the Polynesian linguistic area into the Melanesian. The language of Fiji, with its Melanesian grammar and phonetics, and mixture of Melanesian and Polynesian vocabulary, is to some extent a bridge between them. Fijian has several dialects, but in modern times that of Mbau has become the official language and is taught in the native schools. The other dialects have therefore tended to recede before it. Modern Lau, for instance, is a mixture of the ancient Lau dialect now known only to a few old people, the Mbau dialect and Tongan.

* The spelling of Fijian presents some difficulties. In ancient times there was no system of writing, and the first alphabet was drawn up by Wesleyan missionaries, who partly for typographical reasons used a somewhat arbitrary system of representing the native sounds. Its most notable features were:

c for *th* (pronounced as in the English word *they*)

g „ *ng* („ „ „ „ *singer*)

q „ *ngg* („ „ „ „ *finger*)

d „ *nd* („ „ „ „ *end*)

b „ *mb* („ „ „ „ *camber*)

This system is still in use in mission publications and in most official publications, but an alternative orthography, using the combination of letters as in English, has been frequently used and is employed on most recent official maps. (This system, which is supported by the Permanent Committee on Geographical Names, is followed in this Handbook.) In other respects the spelling is simple; vowels have approximately Continental values, while consonants are pronounced much as in English. The sounds *f*, *p* and *j* have now been introduced into the language to facilitate the use of foreign words, but Fijians often confuse *f* and *p* with each other and with *v*, and *j* (usually pronounced *tch*) is often confused with *t*. The name Fiji itself is a form of the name Viti, adopted by Europeans at an early date from Tongan, where the *ti* was given a sibilant sound.

Fijian, in common with other Melanesian languages, relies for its structure greatly on particles, prefixes and suffixes, but does not use declension or conjugation as these are ordinarily understood. Nouns have no special ending for the plural, and tense distinctions

for verbs are shown by placing small words such as *na* (indicating future) and *a* (indicating past time) before them. Words are very plastic in function; many which are primarily nouns can also be used as adjectives, and many which are primarily verbs can be used as nouns. In many cases a noun is formed by placing the syllable *i* before a verbal root. Thus *i kekekele*, meaning 'anchor' or 'anchorage', is formed from *kelea*, 'to anchor'. Suffixes attached to verbs indicate that they have a definite object, or give a slight change of meaning. *Thabe* means 'to go up'; *thabeta*, 'to go up . . . (a hill, etc.)'; *thabeta-taka*, 'to make . . . go up', i.e., push or carry the thing up. *Kathi*, 'to call', gives *kathiva*, 'to call . . . (someone)', and *kathivaka*, 'to announce'. Prefix and suffix can be used together. From *vinaka*, 'good', comes *vakavinakataka*, 'to make good', 'to mend'. Much of the apparent complexity of long Fijian words is due to this use of prefixes and suffixes and to the free use of reduplication of syllables.

Fijian pronouns have forms unusual to Europeans. In the first person there are inclusive and exclusive forms, one set referring to the person or persons spoken to, the other not doing so. (In English there is no such separation: 'we' can mean either 'you and I' or 'he and I', etc.). Then there are three ways of indicating more than one person—a dual, a trial and a plural. Thus: *keirau* means 'we two'; *keitou*, 'we three' or 'we few'; and *keimami*, 'we many'—in each case the person spoken to is included. 'You' and 'they' are similarly split up. This usage, which correct Fijian demands, seems complicated, but is in fact fairly simple to master and does give more precision than English usage. (Polynesian languages also have both sets of dual and plural pronouns, but do not have the trial forms.)

In vocabulary Fijian has many words closely related to common Polynesian forms, e.g., *vale*, 'house', akin to the Samoan *fale*, Maori *whare*, etc.; *wangga*, 'canoe', akin to Samoan *va'a*, Maori *waka*, etc. Many other words, however, are of a type more closely akin to forms found in the Melanesian languages to the west. Such are *masi* (bark cloth), instead of the Polynesian *tapa*, and *yanggona*, the drink from the root of a pepper plant, instead of the Polynesian *kava*.

Culture

Villages (Fig. 49)

The houses of old Fiji had some variety in general outlines and methods of construction, due to differences in local tradition and

materials, and in the amount of contact with other islands. They could be classified as dwelling houses, sleeping houses for the bachelors and village elders, and temples. The last, serving also as general council chambers, were usually built on an artificial platform of rock. These traditional forms are still to be met in most districts. As a rule the houses are rectangular, with wooden framework thatched with reeds and sometimes having an outer covering of grass or leaves (Plate 29). Walls are from 4 ft. to 10 ft. high and vary in thickness from the width of a single reed to 3 ft.; the innermost

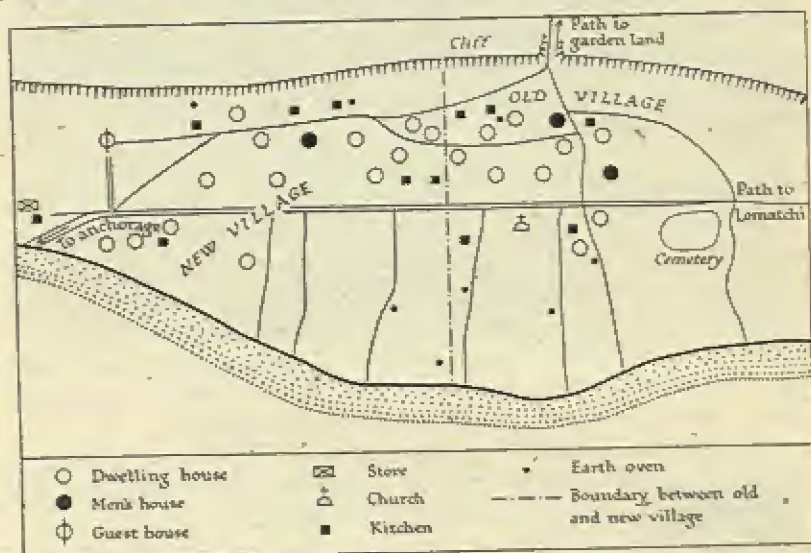


Fig. 49. Sketch plan of Tokalau village, Kambara, Fiji

A typical coastal village showing the irregular lay-out of houses with various functions. The name 'Lomatchi' is a form typical of the Lau dialect; there is no 'tch' sound in the M̄bau dialect (p. 149). Based on L. Thompson, *Bernice P. Bishop Museum Bulletin*, no. 162, p. 13 (Honolulu, 1940).

layer of reed is often decorated with patterns in sennit cord. In the Lau islands, where timber is abundant, houses from 60 ft. to 90 ft. long by 30 ft. wide were commonly built, though these are now being replaced by others of the Tongan oval type.

A village of native houses looks rather like a collection of oblong hayricks with holes in the sides (Plate 18). The houses are usually grouped round a village green of short grass in which stand bread-fruit trees planted for shade and food. In the last few decades there has been an increasing tendency to replace the thatch with corrugated

iron; as in Tonga, the degree to which this has taken place is a fair index of the extent to which a district has been subjected to Western influences. The proportion of iron-roofed houses ranges from 4 per cent. in Tholo North to over 60 per cent. in Lomaiviti.

The average village shelters 50 to 100 people, most of whom are members of one kinship group, either a clan or sub-clan. Where, however, as in some islands of the Lau group, government policy has compelled several villages to concentrate their population at a single centre, the village has become a unit embracing several clans.

In the 'bush' adjacent to the village are the gardens of the people. Those nearest the houses are usually worked by individual families for their own use, while the rest are village lands, cleared and worked by communal labour. The produce from these is used for village undertakings such as a feast or the purchase of a boat.

Social Organization

Fijian social organization is difficult to describe briefly, since its basic principles have been complicated by temporal change and local variation. In essence, however, the system lays primary emphasis on descent through the male line, and recognizes a series of groups to which people belong through kinship. These groups in descending order of size are: *yavusa* (which may be termed 'tribe'); *matanggali* (clan); *tokatoka* (sub-clan); and the individual family.

The individual family of parents and their children is the normal household unit, and for all ordinary purposes is the main producing and consuming unit. The marriage system formerly permitted a man to have more than one wife, though in practice only chiefs and a few other wealthy men could afford a polygynous household. Marriage usually took place between the ages of 18 and 25 years, and from puberty till the time of marriage the youths of the family slept in the village men's house, together with the elders, strangers and husbands of women suckling young children. Nowadays as the result of missionary influence the men's house as an institution has fallen into neglect.

The clan (*matanggali*) comprises a number of families all of which trace descent through the male line from a common ancestor, a real or fictitious person. Yet despite this principle of blood relationship underlying clan membership there is provision whereby widows, orphans and illegitimate children may be transferred from one clan to another by means of an adoption ceremony. The clan is an exogamous unit, its members being permitted to marry only people



Plate 16. Native Fijian

This man shows the Melanesian characteristics of broad nose and frizzly hair typical of most Fijians.



Plate 17. A Polynesian of Tikopia (Solomon islands)

The lighter skin and more wavy hair of the Polynesian marks the contrast with the more Melanesian characteristics of the Fijian. This man is wearing one of his father's teeth as a symbol of filial affection.



Plate 18. Namosi village, Viti Levu

This village, situated in a rocky gorge near the headwaters of the Waindina river, is of the traditional type, with thatched houses. Behind the houses are breadfruit trees.



Plate 19. Beating gongs

Gongs of this type, hollowed out from sections of tree trunk, were used regularly in former times for conveying signals from village to village.

of other clans. It is also patrilocal; that is, its male members on marriage set up house in the village of their fathers, while its women-folk leave the village to live in those of their husbands. But though the paternal kin are thus stressed in the clan organization, the maternal kin are not ignored. A person always enjoys a privileged relationship known as *vasu* with his or her mother's brothers, and through these men with the mother's clan in general. One of the privileges of *vasu* is to be able to appropriate property of one mother's clan without asking permission. Linked with this is also the Fijian form of cross-cousin marriage, by which a man has the right to demand one of his mother's brother's daughters as a wife. The clan is important as a land-holding group, since it often acts as a body in matters of tenure. But one of the major functions of the clan is its role on ceremonial occasions. Betrothal, marriage, the visit of a chief of another clan, and similar social and political events are signalized by a feast. At such times the energies of all members of the clan are taxed in the joint effort to produce huge quantities of vegetables, pigs and *yanggona* (kava), and the provision may be so lavish that some is wasted. At the feasts *meke*, rhythmic chants accompanied by dancing, are performed.

When a clan is very large some of its social and economic functions may be more conveniently taken over by sub-groups intermediate in size between it and the family. These are the *tokatoka*, which may be termed sub-clans. The members of a sub-clan may occupy a village; they are commonly the group which exercises immediate control over land; and they co-operate together in agriculture and other work.

But the clan itself is a sub-group of a larger social unit, the *yavusa* (tribe), which normally comprises about five or six clans, each tracing descent back from the ancestral founder of the whole group. The *yavusa* is a territorial unit, having general interest in the lands of its constituent clans, and at times functioning as the direct owner of land. It is also a political unit, being associated with the system of chieftainship and rank. In some *yavusa*, though not all, the clans are ranked and have specialized functions: the clan of the highest status provides the tribal chiefs; another provides the executive officials who carry out the commands of the chief; still others in olden times provided the hereditary priests and warriors. The *yavusa* also appears to have been in former times a religious unit, the members being bound together by common respect for certain birds or animals as totems, and for the tribal ancestor, who was considered as the

divine founder and guardian of the group. All who successively held the office of tribal head were regarded as being in some measure reincarnations of the original ancestor, and endowed with some of the supernatural power (*mana*) attributed to him. The authority of the living chief therefore rested on a supernatural sanction. Because of the political and religious changes resulting from the coming of Europeans the functions of the *yavusa* have tended to undergo considerable modification during the last century, and the tribal group as such has lost much of its former importance.

A political unit combining a number of tribes was formerly the *vanua*, or confederation. Such confederations, as those of Mbau or Rewa, which arose in the late eighteenth and early nineteenth centuries, were war-making groups the growth of which was fostered in their later years by the use of firearms obtained from Europeans. The bonds uniting the various tribal units into a confederation were allegiance in war to a ruling dynasty and the prospect of valuable support in war with tribes outside the confederation. A further political unit which emerged in the nineteenth century was the *matanitu*, or kingdom (pp. 131-3).

Chieftainship

In former times the organization of many social and political activities was dependent upon the chiefs, and they still exercise important functions, often with the assistance of elders and officials with special duties, such as heralds. The position of a chief is hereditary, and succession generally follows from one brother to another, then reverting to the eldest son of the eldest brother.

Tribes commonly possessed two chiefs in former times. One, the *roko tui*, whose person was sacred, was the patron of the priests; he did not engage in warfare. The other, the *vunivalu*, was the war chief; he also had taboo privileges, but had not the sanctity of the *roko tui*. Questions of law and order within the tribe were settled by the *roko tui*. In disputes he was the sole arbiter and against his decision there was no appeal. The many taboos surrounding him, his acts and his property, ensured respect and support on the part of his subjects. He was thus placed in a very powerful position, but abuse of his power was checked by public opinion and the possibility that his people would refuse to co-operate in any tribal undertaking.

Chiefs of clans often exercised important powers in communal economic undertakings. Under the *lala* system the chief had the right to assemble his clansmen at short notice to carry out a piece of work

for the clan in general, such as building a council house or preparing for a feast. The chief's herald announced every evening the joint tasks for the following day. Sometimes such a mobilization of labour would originate in the request of an ordinary clansman for help, and in this way duty to chief and clan was balanced by enlisting through the chief the support of fellow-clansmen.

Nowadays, with the absence of commoners from the villages as wage labourers or independent farmers, the chiefly power has tended to lose its sanctions and the clan labour force has been depleted. In some areas the communal labour organization has broken down, and through the lack of it plantations are not properly tended and houses have fallen into disrepair. Moreover, the loss of respect for the old taboos, and the great political changes, have weakened greatly the buttresses of the system of hereditary chieftainship.

Land Tenure, Property and Inheritance

Throughout the larger islands of the Fiji group good land has always been abundant, even when account is taken of the shifting cultivation practised by the people. In the smaller islands, particularly the limestone islands of the Lau group, cultivable land is scarce. Everywhere land is divided into the three categories of garden land, village land and bush land, and whether utilized or not is ultimately owned by the clan and administered by the clan chief. Clan members enjoy the rights of occupancy and usufruct of the sections of village land where they build their houses and grow their crops for family use. Such plots are inherited from father to son within the clan, as are fruit trees planted on them. Young men cultivate their fathers' lands until marriage, after which they are allotted their own shares of land. A man has strong claims to the land which he has cleared, though it is held ultimately to be the property of the clan. When family lines die out or cultivation is neglected, land is redistributed to other members of the clan. In former times, if local land hunger arose owing to the growth of population, a family would cut itself adrift from its clan and migrate to another locality, where in due course a new clan linked to the parent clan and worshipping the same gods would arise. Disputes over land were one of the most frequent causes of the former intertribal warfare. Although in the inheritance of land the patrilineal system underlying clan structure is usually followed, it is occasionally waived in favour of the matrilineal principle. A man's *vasu* rights do not allow him to appropriate land from his mother's clan without

permission, but if the due forms of ceremony are observed, such a request is sure to be granted. In exceptional cases where a man goes to live in his wife's village, his children often inherit land from their mother's clan. Uninhabited but fertile islets are often owned and exploited by clans on neighbouring islands. Clan members can freely exploit the bush lands belonging to their clan for timber, wild yams, etc.

In modern times land tenure and the whole Fijian concept of the value of land have changed. By the deed of cession, Fijians retained all their rights to land, though they were prohibited from selling it to non-Fijians. The resulting leasing of land meant that from being of value only for the crops it could produce, it came to have a monetary value; clans which leased land to Europeans or Indians enjoyed an unearned cash income in the form of rent, and although much of this income has been invested in goods such as sailing boats, there remain the dangers of idle landlordism. There has thus been little incentive for clans to embark on the growing of export crops for cash, while individuals have been discouraged from such enterprises by abuses of the *kerekere* system of soliciting gifts (p. 157). But though the communal system of land tenure and productive organization still retains much of its strength, the government has provided for enterprising individuals who desire it a method of escape from their clan responsibilities; they may become 'exempted men' with more definite rights to individual plots of land. In some parts of Viti Levu and Vanua Levu settlements of these individualists have grown up. Details of their farming activities are given on pp. 197, 206.

Fishing rights are clan property, so that sections of the reef opposite a village are claimed as the property of the kinship group living in the village. Co-operative systems of fishing being common, individual fishermen are expected to seek permission to fish from the master fisherman lest their operations prejudice the success of communal fishing drives.

Movable property is owned partly by clans and partly by individuals. The items jointly owned include those objects resulting from communal work: houses, canoes, sails, rolls of bark cloth. Things made mainly by individuals or single households are considered the property of the household where they are made. Certain houses and canoes which are constructed by communal labour but have been paid for by a feast which has been organized by one man are held to be his property.

Formal Exchange

In Fiji, as in most Oceanic communities, formalized systems of exchange of goods between individuals and groups are well developed. These systems are typical of an economy lacking money, though they still function nowadays, when money has come into general use, because of their social functions. The nearest equivalents to money in the old Fijian economy were the highly prized sperm whales' teeth (*tambua*). These were in a category of value by themselves, and among Fijians there were few objects considered as proper to be taken in exchange for them; they were kept mainly for ceremonial occasions. *Tambua* are still highly valued. The possession of them confers prestige on the owner, and they are the most important items in gifts to chiefs.

The group exchanges known as *solevu* were necessitated by differences in local resources. Coastal groups concentrated on the production of salt and mats, while those inland would bring pottery and *yanggona* root down to the coast in exchange. *Solevu* was a formal presentation of goods by one clan to another, and the method was usually similar whether the goods changed hands as tribute or reward, or in free exchange. Technically the goods were presented to the chief, but he distributed the greater part among his people or applied it to their common advantage—for example, by purchasing a new political alliance. The carriers of the goods at such exchanges were always entertained to a feast.

In exchanges between individuals the equivalent of the *solevu* is the *kerekere*. This has been described by Europeans as 'begging', but it is really a kind of exchange of gifts in which each party asks for what he wants, and the return request is often long delayed. Any object which is not taboo can be solicited from another person, particularly from a kinsman. If the owner should refuse to give it up he would lose face; by giving it he gains prestige. The recipient is then under an obligation to the donor, who may later ask for something of greater value in return. Property of all types, from tobacco to pigs or canoes, and rights or privileges, such as the use of garden land, thus change hands. The system has the social effects of reducing the accumulation of wealth by any individual or group, and promoting continual redistribution; of putting a premium on generosity and open-handedness; and of creating an elaborate network of claims and obligations which make for communal solidarity. But nowadays, with the decay of clan sanctions on conduct and greater freedom to evade the duties of the return

gift, the system has become open to abuse, and has evoked official disapproval.

At the present day, with the growing of produce for sale, the working for wages and the payment of rents in cash, these formal exchanges of the *solevu* and *kerekere* type are being increasingly replaced by money transactions. Individuals buy and sell goods and services, and crops grown by communal effort may be sold for cash which may be used to build a village church or help to buy a sailing boat for the province.

Agriculture and Fishing

Agriculture and fishing provide the main sources of food, though forest products are important in some of the outlying islands where suitable soil for gardening is scarce. Several varieties of green leaves are collected by the women and prepared like spinach; the wild arrowroot is a staple food on some islands; the Tahitian chestnut is utilized; and in the grassy dry zones of Viti Levu wild yams are dug up, the grass concealing them being burnt off. Forest produce is especially abundant during the rainy season, from December to April, when most of the fruit trees bear.

Agriculture is carried out on small plantations which are cleared by burning and felling the forest. These patches are cropped for several years and then fallowed to restore their fertility. Cultivation was formerly done with a simple digging-stick, but European iron tools including ploughs and harrows are being increasingly used with horses and draught cattle for traction. The clearing and subsequent cultivation are performed by joint labour with sub-clan or clan as working unit. The chief crops are taro (locally known as *ndalo*), yams, bananas, breadfruit, sweet potatoes and sugar cane. Of these, taro and yams are the staples, though in many districts taro is now being replaced by the more easily grown manioc, which also has the advantage of resisting drought. Both 'wet' and 'dry' taro are grown, but the elaborate irrigation systems formerly used have now been largely abandoned. At least thirty varieties of banana are grown. Sweet potatoes have always been a popular crop and the introduction of new varieties during the nineteenth century has increased their importance.

All the operations in gardening are done by the men. The preparation of food is shared by both sexes; the women boil food in earthenware pots, and the men make and tend the large earth ovens in which flesh and vegetables are steamed.

Animal husbandry is the chief source of meat in Fijian diet, though the methods employed are very simple. Pigs are kept; formerly they fended for themselves, feeding on the fruits, vegetables and insects of the bush. Fences were erected to keep them from invading villages and houses. Now, however, on hygienic grounds and for the protection of crops, the government insists on their being kept in sties. As a result pig keeping has declined, since the Fijians are unable or unwilling to grow additional crops for pig food. Fowls of various breeds are also commonly kept. Little flesh food is obtained from wild life. Fijians are not allowed to use firearms, so that wild pigs are hunted with spears and wild fowls and pigeons are trapped by various methods.

Fishing has always played an essential role in the native economy and as in most Pacific islands has been the basis of a system of exchange between coastal and inland tribes. The local waters are rich in fish of a very wide range of species and habits, so Fijian fishing technology and organization are correspondingly varied. Fishing with multi-pronged spears from the reefs and several elaborate and relatively dangerous methods of turtle fishing from canoes are done exclusively by men. Hook and line are used by both men and women, but the various other methods—netting, stupefying by means of an infusion of poisonous twigs, diving for shellfish, etc.—are all female pursuits.

Canoes

The canoes of Fiji were formerly among the most seaworthy of all those built by Pacific islanders. There were four main types: the *takia*, *tambilai*, *thamakau* and *ndrua*; all but the last are still in use. The *takia* is a small undecked dugout with single outrigger and no washstrakes; a variant of this craft is the *wangga vakatau*, on which washstrakes and covers for each end of the hull are fitted. The *tambilai*, another dugout, is provided with outrigger and has both ends cut square; several feet at bow and stern are left solid. The *thamakau* is a sea-going vessel with dugout hull on which flanged planking is built up to increase the freeboard. Both ends are decked and the central part is raised to give additional freeboard where there is a deck carried on the outrigger booms. A mast 50 ft. high carries a large Oceanic lateen sail with yard and boom each half as long again as the mast. Such craft have been built up to 100 ft. long, though 50 ft. is a more normal length. With the wind on the quarter a speed of 10 to 15 knots is possible, though the craft is very slow

down wind as she is continually burying her bows. The *ndrua*, which is no longer used, had a deck-house and was of the same general build and dimensions except that the outrigger was replaced by a second and smaller hull; it was thus, in a sense, a double canoe and was used for overseas voyages. On war expeditions up to 250 men were carried on a single *ndrua*. The last craft of this type was built in 1913.

With the growth of European influence over the past century, boats and cutters have been steadily supplanting all but the smaller types of dugout. Canoes were regularly exported to Tonga from the Lau islands, which produce greenheart, the best wood for their manufacture.

Other Native Manufactures

Before familiarity with the products of Western commerce had led to the decay of craftsmanship, Fijian craftwork was of a high standard. Bark cloth was beaten by women from the bark of the paper-mulberry tree; for ceremonial occasions continuous rolls several hundred feet long were prepared. Houses were well built and commodious. But the two outstanding arts in Fiji were wood working and pottery making. The achievements of the hereditary carpenters with stone and shell tools compel admiration. *Yanggona* bowls two or three feet in diameter, perfectly regular in shape and with four or more feet cut out of the solid wood, were adzed into shape from ironwood. Other fine achievements in wood carving were the heavy, highly polished wooden clubs used in warfare. Their heads were cut into a great variety of shapes—some knobbed or spiked like a mediæval mace, others made with sharp edge and broad blade. Large gongs were also carved out of the solid wood (Plate 19).

Pottery making, one of the feminine crafts, reached very high technical levels. Local clays tempered with sand were modelled by hand into a variety of globular shapes, often with small necks, based perhaps on gourd prototypes. Incised ornament was profuse on the upper parts and round the necks of the vessels. A frequent practice was to make groups of small pots linked together by their handles like a cluster of two or three coconuts. When meant to hold liquids the pots were coated with resin after firing.

Another important feminine occupation was the plaiting of fine mats of various types from coconut and pandanus leaves. Dyed strips were interwoven with plain ones to produce many kinds of geometrical pattern. Canoe sails were always made of matting.

The decline in quantity and quality of craftwork has been considerable in the last few decades. Double canoes are no longer built. Pottery is made only in a few remote villages on the two main islands, and bark cloth is now made on a very much reduced scale, solely for ceremonial occasions, being replaced for everyday wear by calico.

Fijians no longer wear the bark-cloth kilts and grass skirts of pre-European days. Cotton kilts (*lavalava*) or short-trousers (often with shirts as well) are now the rule for men, and cotton print dresses for women.

Warfare

In early times warfare was probably little more than skirmishes between neighbouring tribes arising from disputes over land and women or insults to chiefs. Cannibalism took place in war, though prior to the rise of the confederacies the eating of human flesh was a prerogative of those of high rank and occurred only after ceremonial sacrifices in celebration of victory or the launching of a chief's canoe. Later, however, feasts came to be considered incomplete without human flesh, and by the early nineteenth century, if missionary accounts are to be believed, the taste for human flesh was itself a main cause of wars. Participation in cannibal feasts was even thrown open to commoners. Still, at this period when warfare was at its height, the annual slaughter was probably less than 2,000 out of a total population of about 200,000. The warring tribes fortified themselves in stockaded villages with earth and stone ramparts and would lay siege to their enemies only when supported by favourable oracles from their priests. Cunning and treachery rather than courage to fight in the open were the rule, and the victims included both sexes and all ages. Heavy wooden clubs and barbed spears were the standard weapons until supplemented and later supplanted by muskets obtained from Europeans. The armies of even the largest confederacies rarely exceeded 1,000 men. Allies were sought in tribes connected by marriage or by possession of gods in common.

The abolition of warfare has meant a change of great moment in Fijian society. Weapons are no longer carried by the men, stockades are no longer maintained round the villages and cannibalism has ceased to be practised. The position of the chiefs has been affected by the cessation of their functions as war leaders, and the establishment of peace has allowed security for travel and for social and economic life.

Religion

All Fijians today are nominally Christians. The ancient Fijian religion contained several sets of beliefs and practices, the variety of which can perhaps be attributed to different groups of people, Melanesian and Polynesian, who arrived at various periods in Fiji. The system of ancestor worship is reminiscent of Polynesia, while concurrent with this was the more typically Melanesian system of totemism in which the various tribes and clans believed that the spirits of their ancestral founders became manifest in various animals and plants. The rites connected with this belief generally took the form of a prohibition on the killing and eating of the totem of one's own group. Other supernatural beings included various types of spirits which at times entered into and possessed their devotees. The Fijians believed that after death a man's soul travelled along the great Spirit Path of Viti Levu, which crossed the western half of the island.

Priests formed a kind of hereditary caste. They officiated at sacrifices to the ancestor gods and by inducing a state of mental dissociation became possessed by the gods concerned and thus acted as their mouthpieces. Through them the chiefs could consult the oracles before undertaking any ambitious project. As exorcists they performed the role of healing magicians, appeasing and banishing evil spirits.

The present-day Fijian religion represents a fusion of Christian and ancient Fijian elements. Ancestor worship and therefore much of the power of the chiefs has been swept away, but the various spirits of the old religion have become either alternative powers to be resorted to when the Christian god appears to turn a deaf ear, or evil spirits leagued with the Christian devil. As elsewhere, the Christian religion has been the pioneer of education (pp. 189-92).

INDIANS

Indian immigrants were first brought into Fiji because of the brutality and growing inadequacy of the labour traffic among the Pacific islands. Thus, being valued only as field hands and not regarded as permanent colonists, they suffered many hardships. No attempt was made to establish a satisfactory ratio between the sexes. (As late as 1921 the number of males between the ages of 20 and 40 was almost double that of females.) No regard was paid to their religion or to their education. They were usually housed in groups

of long wooden hutments, dreary and crowded, generally described as 'coolie lines'. Often they were in charge of harsh and ignorant overseers, who saw no need to learn their languages and who relied upon the whip to maintain order. In return they acquired the vices natural to their condition. The murder and suicide rates rose far above those of India; the normal code of behaviour in sexual matters was widely disregarded; and there was much petty thieving and cheating. But in the course of time many obtained a secure position in the life of the colony; educated Indians came to Fiji and helped to shoulder the burdens of leadership; and close co-operation was re-established with the leaders of religious and political life in India. At the same time, Christian missions in the colony began to do more to help—establishing schools, urging the need for a general improvement in conditions and exposing abuses. The Indian population of Fiji is now notable among Indian emigrant communities for its rapid increase in prosperity and social well-being.

The first immigrant ship, the *Leonidas*, arrived in 1879. By the end of 1888 the Indians in the colony numbered 6,370; ten years later their number had increased to 12,397. Under agreement with the Government of India all recruiting was done by the Fijian government and immigrants were allotted to private employers under official supervision. The agreement provided for five years' work under indenture, followed by five years spent in the colony in free labour; at the end of that period a free return passage to India would be provided for the immigrant and his family. In spite of the hardships, from the beginning a large proportion did not choose to be repatriated, for life in Fiji, once the period of indenture was over, offered economic opportunities far greater than those they had known in the peasant communities of the United Provinces and the Madras Presidency, or in the depressed quarters of the great cities of Madras and Calcutta. Of the 481 immigrants by the first voyage of the *Leonidas* only 148 made use of their return passages; and during the last fifteen years in which labourers were brought in under indenture, 1901-16, the number introduced averaged 2,497 per annum and those repatriated only 989 per annum. Further, many of those who returned home found a resumption of their old life either unattractive or impossible and came again to Fiji, as free settlers (if they still possessed money to pay their fares) or once more under indenture. A further element in the Indian population—the one which is now of dominant importance—consists of those born in Fiji. In the 1936 census the total number of Indians was found to

be 84,983; and of these 60,644, or 72 per cent., were recorded as born in the colony.

Occupations

At the present time about two-thirds of the entire Indian community is dependent upon the sugar industry. The number of cane farmers alone is estimated at nearly 9,000. The most important, and on the whole the most prosperous, group consists of tenants of the Colonial Sugar Refining Company. Others lease land from Fijians.

A further 7,000 Indians are engaged in agriculture—mainly mixed farming. The most important crop is rice, for which there is a ready market among all sections of the Indian community. Maize is also largely grown, as are peas, beans, and other vegetables. Tobacco is grown in suitable areas near Indian markets, *yanggona* by Punjabi farmers near Suva, and cotton in the drier farming areas. The keeping of cattle also forms an essential part of the Indian economy. Oxen are used as draft animals; milk and *ghee* are important items in Indian diet; and near the towns Indian farmers take a large part in supplying milk and butter commercially. Goats are also kept by many.

Many Indians also—to the number of about 8,500 in 1938—are engaged in various non-agricultural employments. They own most of the small retail stores in the more thickly populated parts of the colony and manage many of the branches of the larger European-owned merchant houses. They almost monopolize the tailoring and shoe-repairing trades and jewellery manufacturing. They own most of the motion-picture theatres. In 1935 they drove about 80 per cent. of the motor vehicles used for public purposes; and they are similarly employed on the railways. Many Indians also are in the public service as clerks; and a few are engaged in the professions.

The Indians have organized weekly bazaars in the principal centres. The bulk of the goods offered for sale are foodstuffs—sacks of grain and pulses, rice, mangoes, egg-plants, turmeric, chutney, *ghee*; but tobacco and silks and other textiles are available, and much locally or Indian made jewellery which is valued both for display and as a means of storing wealth. Barbers are present to ply their craft. In places such as Suva, Lautoka, Nausori and Lambasa the bazaars are the occasion for the gathering of great numbers of Indians from the surrounding settlements and farmlands. They play an important part in the social as well as the economic life of the Indian community.

Living Conditions

The way of life of the Indians in Fiji is still deeply coloured by the heritage of poverty in their homeland and of restriction and semi-servility in the colony. They are industrious and frugal, seeking security and improved social position by the acquisition of wealth. Only among the children brought up in the easier conditions of present-day Fiji is there a tendency to adapt hours of work and standards of living to those of the other communities.

The normal daily round of the Indian farmer begins between about 5.30 and 6 a.m. In the season, he uses the cool hours of the morning (until about 10 o'clock) for ploughing. During the heat of the day, while the oxen rest, he milks his cows, hoes his crops and cuts fodder for his stock. In the late afternoon he ploughs again. Work ends between 5 and 6 o'clock. His food is simple: for breakfast, *roti* (a bread made from flour fried in *ghee*); for lunch, rice or curry; for supper, rice, curry and chutney; with milk or tea to drink at each meal. His house is built of rough timber, of corrugated iron, or of reeds in the Fijian manner, with one or two rooms (Plate 21), and often with beds as its only articles of furniture.

Members of the Indian community have saved much money and sent much back to India. They have invested heavily in tools and livestock, and spent lavishly in ways which would bring prestige—in celebrating the birth of a child or the marriage of a daughter. But this strenuous quest for security and social advance has not saved them from the burden of debt. The money-lender is a familiar figure in Fiji, as in India. The rates of interest he charges often keep the borrower permanently in his grip. Since recent legislation (p. 177) removed the Indians' major difficulties in obtaining secure tenure of their land, the problem of indebtedness remains the chief impediment to the further advance of the Indian farming community.

Social Organization

As the Indian community has become more settled and more ~~prosperous~~, it has returned in considerable measure to traditional ways and forms. This has been demonstrated most strikingly by the increased attention to religious rites and observances and by the tendency to act for political and social purposes through societies primarily religious in origin. According to the 1936 census, about 84 per cent. of the Indian community was Hindu, about 13 per cent. Muslim and the remaining 3 per cent. divided between Sikhs and

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Christians. The adherents of both the major religions have been active. Temples and mosques have been built in many districts; priests have come from India; there has been vigorous dispute as to principles and practices between different sects within each community—as between orthodox Muslims and adherents of the Ahmadiya sect in 1933, or between Sanatan and Arya Samaj Hindus a little earlier. Religious festivals have come again to be among the most important events in the year for the Indian community. The religious societies have also been active in education (p. 191). In the schools which they control, prayers and sacred songs and writings still form an essential part of the curricula.

In other activities also the Indians have gradually recovered some sense of unity. In many Indian settlements the organization of the *panchayat*, or council of elders, has been in part revived; a group of respected men is appointed by the inhabitants to settle minor disputes among them, so as to avoid resort to the courts. Sometimes they will also decide as to the form of social functions, such as feasts and concerts.

But though much has thus been recovered of former ways, much has also been changed permanently by experience in Fiji. The length and number of religious festivals have been reduced, particularly among Hindus. Women no longer wear the veil, and men have adopted European dress. Hindus of high and low caste sit together in the schools or at meetings and live in close proximity to one another. Caste restrictions on occupation have been greatly weakened. Hindus and Muslims work together on committees and attend each other's marriages and other social functions. Experience as a racial minority has heightened the sense of Indian nationality, at the same time as it has modified and simplified the practice of the religious and social code learnt in India.

In colonial politics, still largely the preserve among Indians of a small educated minority, this sense of Indian national unity naturally finds its clearest expression. To some extent it is imposed by the constitution, since Indians (like other sections of the population) are represented in the Legislative Council on a communal basis. Indian politicians follow closely the actions and pronouncements of the Indian National Congress. The policy which they have advocated, to some extent under Indian central direction, has been similar to that put forward by leaders of Indian immigrant communities in other colonies, such as Kenya. It is superficially paradoxical that at the centre of that policy is the demand for a common electoral roll

with Europeans and Fijians. But this demand indicates no desire that their group should lose its separate identity. Instead, it springs from the belief that communal separatism, legally enacted, denies them some of the influence which would be theirs under normal representative government.

EUROPEANS

During the last 35 years the European community in Fiji has remained between 3,500 and 5,000 in number. The 1936 census showed 4,010 persons classified as Europeans. Of these 36 per cent. were born in Fiji, 40 per cent. in Australia or New Zealand and 16 per cent. in the British Isles. These figures represent roughly the divisions into which the community can be divided by interests and outlook—those who regard Fiji as their permanent home; the more recent, and often temporary, immigrants from the neighbouring Dominions; and immigrants from Great Britain.

Among the first group many are descended from settlers of the cotton-growing period of 1865-75. In former times they were largely engaged in plantation agriculture; but gradually they were forced out by economic difficulties, until by about 1920 they retained an important interest only in copra production. Since then this also has diminished. At the present time they are principally interested in trade and commerce, the professions and the civil service. They have always provided most of the local political leaders and have fought most vigorously for the development, and more recently the retention, of representative forms of government. They have clung longest to the ideal of a future in which the colony's resources would be divided between the native Fijians and a flourishing European settler community. They have watched uneasily the growing influence of the Colonial Sugar Refining Company and the increasing numbers of the Indians.

More recent immigrants from Australia and New Zealand comprise principally, besides members of the government service, employees of commercial or industrial firms and of banks with headquarters in the Dominions, and employees of the larger local firms. Their interest in colonial affairs is economic rather than political.

The third group—consisting of recent immigrants from Great Britain—includes, as perhaps its most important element, many members of the administrative and professional sections of the civil service.

Living conditions for Europeans approximate to those in other relatively advanced Pacific islands dependencies. Houses are built usually of wood with broad verandahs, and tall French windows to admit the maximum of fresh air to the rooms; furniture is simple, often of cane or reeds, and floors are left largely free of carpets and walls of paper to reduce the ravages of insect pests. The food supply of Fiji is unusually good for an island community, owing both to the varied local production and to the proximity of Australia and New Zealand. The cost of living is moderately high, but so also is the income level of Europeans. According to 1935 figures, one European in four (inclusive of children) held a licence to drive a car.

MIXED-BLOODS

In Fiji, as has been seen (p. 131), a separate mixed-blood community has existed for nearly a century. Before cotton growing attracted new settlers in the years after 1860, the mixed-bloods had become more numerous than those of wholly European origin. In recent years this situation has occurred again. The 1936 census, which showed 4,010 Europeans, recorded 4,524 'persons of mixed European and Native descent'. These comprised 3,448 of Fijian-European ancestry, 663 Polynesian-Europeans and 413 'others' (probably mainly Melanesian-Europeans). The majority are predominantly non-European in origin, a considerable proportion being as much as seven-eighths Fijian or Polynesian.

According to the census figures, 26 per cent. of this mixed-blood community resided in Suva or its immediate vicinity and 29 per cent. in the islands of Vanua Levu and Taveuni and their off-lying islets. Other groups resided near Levuka, Lautoka and Mba. The remainder, about a quarter of the whole, were fairly widely scattered throughout the colony.

Members of the community have always had a high reputation as navigators and sailors on the schooners and other small vessels trading within the group. In more recent times many have entered the employment of the government, the Colonial Sugar Refining Company and business concerns generally. These, however, form the more educated section of the community. The 1936 census revealed that 21 per cent. of those over 15 years of age were illiterate (compared with 16 per cent. for Fijians) and that about 28 per cent. of those over 5 years of age were unable to speak English. This backward group is drawn mainly from the rural areas and particularly

from Vanua Levu and Taveuni. In these two islands mixed-bloods own the greater part of the alienated coconut lands, and during times when copra prices were high many of them enjoyed very satisfactory incomes. In recent years, however, with low prices and steadily growing families to provide for, a majority have been in great poverty. Denied the support of the communal institutions of the Fijians and unable through their poverty to conform to the standards of the Europeans, many of them have become somewhat apathetic. The improvement of the conditions of this rural section of the mixed-blood community is a problem to which the attention of the government has been increasingly drawn in recent years (p. 192).

In religion the mixed-bloods are nearly all either Methodists or Roman Catholics. The Roman Catholic Church has, as with part-European communities in other parts of the Pacific, devoted special attention to their problems.

For political purposes they are classed with Europeans. Those who are descended from a European on the father's side (in practice virtually the whole community) and who can read, write and speak the English language are eligible to vote in Legislative Council elections on the same conditions as Europeans. It is believed that the 'European' electoral roll already contains upon it a majority of persons of mixed-blood. Unless conditions change materially so as to promote fresh European settlement, this majority is almost certain to increase. So far, however, no mixed-bloods have taken any leading part in local politics.

(For Bibliographical Note see Chapter V.)

Chapter V

THE FIJI GROUP (*cont.*)

Government: Social Services: Economics: Ports and Settlements:
Communications: Bibliographical Note

GOVERNMENT

CENTRAL GOVERNMENT

The Government of Fiji conforms to the general model for the more advanced British Crown Colonies.

The Governor. The Governor represents the Crown, and is the chief executive officer and the president of the Legislative Council. As in other colonies, he possesses very considerable power and freedom of action, though today Imperial control (exercised through the Secretary of State for the Colonies) and local advice (tendered principally by the Executive and Legislative Councils) play an increasing part in the government.

The Executive Council. The Executive Council which assists the Governor has grown from a small, and largely informal, body of senior officials. In addition to the Governor himself, it now includes his three senior officers, as *ex officio* members, and four nominated members—two official and two unofficial, of whom the latter are normally chosen from the European unofficial members of the Legislative Council. The Governor is bound to consult the Executive Council on all important questions; and, though he can act in opposition to its advice, he is required to report to the Secretary of State his reasons for doing so, and the members of council can require that their opinions be placed on record. In practice the council has thus come to possess a much greater influence than its nominally advisory character would indicate.

The Legislative Council. The Legislative Council is the principal law-making body of the colony. Like the Executive Council, its size has increased and its composition changed greatly since its inception in 1875. It first consisted of a few officials and representatives of the unofficial European community nominated by the Governor. Then, in 1904, a system of election for European members was introduced, and Fijians first entered the council as nominated members. Twelve years later the first Indian member was nominated; and in 1929 provision was made for Indian elected members.

These changes accurately reflected the principal political currents of the time. But they achieved no final solution. From 1929 to 1936 prolonged discussion of further changes took place. At length the government worked out a compromise which was satisfactory to most sections of opinion and was embodied in Letters Patent issued in 1937. Membership now totals 32, made up of the Governor (as President), 16 official members and 15 unofficial members, the latter representing the European, Fijian and Indian communities in equal numbers. Of the European and Indian unofficials 3 are in each case elected and 2 nominated by the Governor. The franchise is restricted by a low property qualification. This is no barrier to Europeans, owing to their high income level, though it must exclude a proportion of the mixed-bloods ('half-castes'), who are also classed as 'European' for electoral purposes. Among the Indians this qualification and the requirement of literacy designedly limit the right to vote to the more politically interested minority. Fijian representation continues to rest upon the original basis of nomination by the Governor from a panel of names submitted by the Great Council of Chiefs (pp. 182-4).

In recent years the council has met from two to four times annually. In addition to its primary function of enacting legislation, it serves as a forum from which the unofficial members can make their views on general subjects known to the government and provide a lead to public opinion through reports of council proceedings in the press. In divisions the government can command a majority of votes even when all the Unofficial Members are united against it. But, as Governors have repeatedly said, the council exists to decide matters by discussion and compromise, not by formal votes. The power of the minority is thus a very considerable one.

The Western Pacific High Commission

The *joint* tenure of the office of High Commissioner for the Western Pacific. This was set up in 1877 by the Western Pacific Order in Council. It was a natural development from the measures which Britain had taken over a period of more than fifty years, hitherto with little success, to obtain control over her subjects in the many islands still under native rule. Under the Order the High Commissioner was authorized to make regulations applicable to British subjects within his jurisdiction, and machinery was set up for the trial and punishment of offenders.

Experience showed many flaws in the system. In particular, it seemed anomalous that, while British subjects were frequently punished for offences against natives or against the subjects of other Powers, neither natives nor foreigners could legally be dealt with for their actions against British subjects. To make persons who were not British subjects liable to punishment in British courts for offences committed in non-British territory involved the introduction of a novel principle into British, as into international, law. But, in the peculiar circumstances of the Pacific, the government concluded that the break with tradition was unavoidable. Natives and other foreigners were, therefore, brought under the jurisdiction of the High Commissioner by the Pacific Order in Council, 1893, which replaced the earlier Order and which remains the main legal foundation of the High Commission as it exists today.

The jurisdiction of the High Commissioner extends over all islands in the Western Pacific not within the territories administered by Australia, New Zealand, or the Colony of Fiji, and not within the jurisdiction of any foreign Power. The High Commissioner's duties relate principally to the less important territories in regard to which Britain has acquired sovereign rights or incurred particular political responsibilities. These comprise the Gilbert and Ellice Islands Colony (including most of the Line islands), the British Solomon Islands Protectorate, the New Hebrides and their dependencies (a Condominium with France), the Phoenix islands (of which two, Canton and Enderbury, are now ruled jointly with the United States), and the Pitcairn group.

The establishment of the Commission includes a Chief Judicial Commissioner (an office held *ex officio* by the Chief Justice of Fiji), a Central Medical Authority (an office held by the Fiji Director of Medical Services) and a Secretary. In addition, certain officials in the High Commission territories are created Deputy Commissioners; and all British officials within those territories are subordinate to the High Commissioner. Contact is maintained with Suva through periodical cruises by the High Commissioner and other officers. The expenses of administration are met from the funds of the Gilbert and Ellice islands and the British Solomon islands, supplemented by a grant from the Imperial government.

The Administrative System of the Colony

The principal executive officer under the Governor is the Colonial Secretary. Closely associated with him are several other senior

officials who, like him, possess direct access to the Governor. These are the Financial Secretary, the Secretary for Fijian Affairs, the Secretary for Indian Affairs, the Attorney-General and the Director of Medical Services. These posts, together with other administrative offices, are normally filled by members of the unified British colonial services and are nearly always occupied by men with



Fig. 50. Fiji: district boundaries (before September 1938)

Based on *Legislative Council Paper*, no. 2, 1937 (Suva). Projection as in Fig. 42.

previous service in other parts of the empire. It is noteworthy, therefore, that one of the most important of them, that of Secretary for Fijian Affairs, is at present (1944) filled by a native Fijian, Ratu J. L. V. Sukuna.

District Administration. During the early years of British rule European officers were stationed in the different areas to assist the native administrative authorities and courts; to act as local repre-

with District Officers subordinate to him stationed at important points.

Finance

From the foundation of the colonial government until about 1900 the only considerable sources of revenue were customs duties and native taxation. Of these customs revenue was always the larger, but native taxes accounted for between one-third and one-sixth of total revenue. The distribution of expenditure at this period presents



Fig. 52. Fiji: revenue and expenditure, 1875-1940

Based on: (1) *Colonial Office Annual Report* (London, 1876-1940); (2) *Journal of the Legislative Council* (Suva, 1940-2).

an equally simple picture. Practically nothing was spent on social services, between 5 and 10 per cent. on the most indispensable public works and the remainder for paying the salaries of the under-staffed civil service.

After 1900 the rapid economic advance of the colony produced a complete change (Fig. 52). Native taxes became an insignificant proportion of total revenue—about 9 per cent. in 1906, less than 3 per cent. in 1935; customs revenue increased greatly, remaining

the most important single item; and many new taxes—e.g., income and business profits taxes—were gradually imposed. One of the most notable changes in expenditure was the greatly increased vote for public works. Over the last thirty years it has usually amounted to between one-fifth and one-third of total expenditure. The other most striking change was the gradually mounting expenditure on social services (pp. 186-92). The government was now able to do more than merely keep the peace and maintain the law.

This change necessitated the expansion of departmental organizations (e.g., the police and medical departments) and the foundation of new departments (such as those of agriculture and education). Government policy became more intricately interwoven with the ordinary lives of the people.

Land Policy

The principal agency for carrying out government policy in relation to the land is the Department of Lands, Mines and Survey. Associated with it are several *ad hoc* bodies, of which the most important are the Native Lands Commission and the Native Land Trust Board.

In Fiji land policy has presented a number of difficulties intimately connected with the broader social problems of the relations between the different communities. To achieve their solution policy has had two main aims—the protection of native interests and the effective utilization of the land.

The first step towards the protection of native interests was the prohibition, soon after British annexation, of all further sales of native land to private persons. Except for the period 1905-09, when sales were again permitted, this has remained government policy. A second step was taken with the setting up of a Native Lands Commission to establish titles. This body has a European as chairman and two or more native chiefs as members; its clerical staff is native; and its proceedings are conducted in Fijian. It has been at work since 1912 and titles to large areas of land have been issued to many clans and smaller groups.

It has been much more difficult to ensure that the land so protected should be effectively utilized. In part, this is a problem of education. It is also one of tenure. At first native land could be alienated for a maximum period of only 21 years. This proved a severe barrier to settlement. In the period from 1875 to 1896 only a hundred leases for a total of about 13,000 acres were issued; and of

the area thus comprised nearly a third was obtained for timber felling. In 1905, therefore, the permissible period was raised to 99 years. With various modifications—affecting such matters as compensation for improvements—this remained the basis of Fijian land policy until recently. The procedure was for the intending lessee to lodge an application with the government, which then ascertained the ownership of the desired land; the owners were then invited to hand over the land to be leased on their behalf; and if they were willing it was put up to auction.

This system worked reasonably well for the lease of large areas; but it proved inadequate in the face of the continually growing demand of Indian peasants for small fargns. Modifications were, therefore, introduced. Auction was dispensed with where the area was small, while the maximum period for which a lease could be granted was reduced in respect of Indian lessees. (Until 1930 the maximum was 27 years; after that there were some extensions for a further 9 years.) But the situation which developed satisfied neither Indians, nor Fijians, nor the government. The Indians demanded longer leases and greater security of tenure; the Fijians were torn between the desire to procure an easy income by leasing their land and that of protecting their interests and developing the land themselves; and the government was disturbed by the wasteful system of agriculture which the existing insecurity encouraged. The conviction grew in official circles that a much greater degree of governmental control over native land was necessary. Fijian leaders recognized that the initiative in making a change could most appropriately come from them, and in 1936 the members of the Great Council of Chiefs passed a remarkable resolution declaring that it was in the best interests of the Fijians that all land not actually required by them should be opened to settlement and proposing means whereby this change could be brought about.

The result was the passing of the Native Land Trust Ordinance of 1940. This was based upon a similar measure introduced in Kenya ten years earlier, but it gave to the government considerably wider powers. A Native Land Trust Board, consisting of the Governor, the Adviser on Native Affairs and one native member, was set up to administer all native lands. Provision was made for the appointment of local committees under the chairmanship of District Commissioners to advise the board on local matters. The board is empowered to set aside native reserves, within which there can be no dealings in land except between Fijians. In respect of all other

lands the board can grant leases and licences of occupation, provided that the land concerned is not actually being used by Fijians or likely to be required by them during the period of alienation. All subsequent dealings with the leasehold, except the raising of mortgages, require the board's consent. Its control over land revenues is similarly comprehensive: moneys received may be invested on behalf of the owners instead of being paid directly to them, in order to prevent squandering.

The existing situation, whereby Fijians own most of the land, Indians largely work it and Europeans provide a majority of the capital, is thus an unusually complex one; but the new system of control was inaugurated with the support of most of the leaders of all three communities.

Agricultural Policy

The Department of Agriculture was formed in 1905. Its early work was largely in experimenting with crops suitable for plantation agriculture. More recently it has devoted its attention mainly to raising the agricultural standards of Fijians and, to a less extent, of Indians.

This change in emphasis became evident about 1930. In that year an Agricultural Advisory Committee was set up, consisting of the heads of the Departments of Agriculture and Education, the Secretaries for Native and Indian Affairs and a representative of the Methodist mission. In co-operation with the Education Department, the Methodist mission and the Colonial Sugar Refining Company, a fairly comprehensive programme has been maintained. As its share of the joint project, the Department of Agriculture has given field instruction in various districts, trained selected native pupils at its experimental stations as instructors, and given general assistance in the selection and growing of crops and in marketing.

Forestry Policy

Until recent years government action in regard to the preservation and use of the forests was limited. The need for more effective control had, however, been recognized for some time; and in 1938 a Forest Department was established. Its organization and methods were modelled on those of Malaya. It administers the forest reserves and, on behalf of the Native Land Trust Board, all forests on native land. It has introduced more efficient methods of exploitation of forest areas (including mangrove forests) and undertaken experi-

ments in the use of various forest products. These developments have, up to the present; been on a comparatively small scale owing to necessary concentration on the supply of timber for war purposes.

Public Works

The extensive works undertaken in the last twenty years have raised the Public Works Department to a position of great importance as a government spending agency. In recent years it has employed about 1,000 men and spent about £700 per working day. Among its most notable achievements have been the construction of the circuminsular roads in Viti Levu, the building of the Rewa river bridge (Fig. 68) and the erection of the new government offices in Suva. In addition, however, it has also undertaken much mechanical, electrical and marine engineering. It maintains a shipyard, erects lighthouses and marine beacons, and is responsible for the inspection of steam boilers and electrical installations.

The principal officer of the department is the Director of Public Works, who also holds the titles of Commissioner of Roads and Commissioner of Water Supply. His office is at Suva. For executive, as distinct from administrative, functions the department is organized in two divisions. The larger, responsible for the eastern part of Viti Levu and all of eastern Fiji, has its headquarters at Suva. The other is centred at Lautoka. Both possess their own water and road transport, so that works can be carried out independently.

LOCAL GOVERNMENT

The central organization of government is supplemented in Fiji by a wide variety of local governing bodies. These are of two main types: (i) bodies administering the towns and other principal settlements; (ii) native authorities which function as a system of rural local government.

The Administration of Towns and Settlements

The bodies at present administering towns and settlements are the result of an interesting process of evolution. They have their origin in the attempts of the settlers at Levuka to maintain law and order within that settlement. These efforts finally led to the establishment of a municipality during the period of Thakombau's rule. After British annexation its work was carried on by a Town Board.

When the capital was moved to Suva a similar body was established there. The European settlers, however, were dissatisfied, and a new Municipal Institutions Ordinance was finally passed in 1909. Municipal Councils, with members elected by the ratepayers and wide administrative powers, were then set up at Suva and Levuka. They continued to function until 1935 and remained strongholds of European settler opinion. But conditions were changing. Suva, with the rapid growth of recent years, had ceased to be a mainly European centre and had all the problems of a town inhabited by three separate communities, while Levuka had sunk gradually into poverty. An Ordinance of 1935 therefore replaced the Suva Municipal Council by a Town Board. The members of this body are all nominated by the Governor. They consist of seven officials and two unofficial representatives of each of the three communities—European, Fijian and Indian. The board is responsible for public health and sanitation, markets, traffic, building construction, etc., and it manages the electricity supply. It levies rates and collects licence fees from businesses in the town. In the same year the Levuka Municipal Council was replaced by a Township Board.

The latter form of body was provided for by the Townships Ordinance of 1928. It possesses very limited powers, largely relating to the control of sanitation. The first boards had been established in the sugar-milling centres of Nausori and Namoli. Since the setting up of the Levuka board, others have been founded in two further centres of the sugar industry, Mba and Lambasa.

Native Administration

The Fijian system of native administration differs from that in nearly all other parts of the British Empire in that it not only acts as a system of local government but provides a direct link with the central government. In most of its essential features this system remains much as it was when first introduced by Sir Arthur Gordon in the early years of the colony. But there has been considerable change in the spirit in which it is operated as the Fijians have established gradually widening contacts with the institutions of the immigrant communities—both European and Indian—within the colony. Governmental organization has been concerned with provinces, districts and villages as political units, not with confederations, tribes and clans. It has attempted, wherever possible, to appoint to office men who were entitled to advancement according to native rules, but it has not hesitated to appoint others when this

seemed expedient. Thus kinship bonds have become less strong; geographical groupings have become more important; and the position of individual chiefs and chiefly families has come to depend more and more in all but purely ceremonial matters upon the enjoyment of the confidence of the government.

At the lowest level of organization is the village headman, or



Fig. 53. Fiji provinces

Based on G.S.G.S. map no. 4295 (Cassini's projection).

turanga ni koro, who, under Native Regulations, organizes the people of the village for the performance of all communal activities. These include gardening, village planning, house-building and sanitation, the maintenance of roads and communal property, and the control of infectious diseases. In addition, he welcomes guests and, whenever necessary, convenes village assemblies.

Then comes the organization of the districts (or *tikina*), each again presided over by a headman, known as the *Mbuli*. He has considerable administrative power and is charged with the supervision of the villages within his district and the organization of communal activities requiring the co-operation of several villages. Associated with him is a district council (or *mbose ni tikina*) composed of local chiefs and the village headmen, over which he presides; this body meets at about monthly intervals. The whole colony is divided into 153 of these districts. Their boundaries, wherever possible, follow the tribal divisions of former times.

The districts are in turn grouped in nineteen provinces (Fig. 53), which are governed through a somewhat similar organization. Formerly the chief executive officer of the province was nearly always a native chief, known as the *Roko Tui*. But the increasing complexity of government has now generally made it desirable to place a European administrative officer at the head as Provincial Commissioner. The *Roko Tui* (or Native Assistant Commissioner, as he is known in some provinces) has become his deputy. There is also a provincial council, which meets once a year. This includes the *Roko Tui*, the *Mbuli* of the various districts, native stipendiary magistrates, native medical practitioners and certain elected chiefs. It is presided over by the Adviser on Native Affairs or the Provincial Commissioner. Its proceedings include the presentation of reports by the *Mbuli* on their respective districts. The provincial council is one of the instruments used by the government to obtain native opinion upon questions of policy. In addition, its meetings provide an opportunity for the strengthening of local and tribal ties. Large parties from all parts of the province assemble for it, and there is much ceremonial.

Above the provincial councils again comes the Great Council of Chiefs (*Mbose ni Turanga*), which represents the whole Fijian people. When Sir Arthur Gordon inaugurated this body in 1877, he conceived it as a continuation of the councils of chiefs which had met at irregular intervals during the fifteen years preceding British annexation. Its membership was therefore dominated by the chiefs of highest rank, represented by the *Roko Tui*, though it included also *Mbuli* elected by the provincial councils. Gordon was also aware, however, of the necessity for associating with it representatives of the newer class of leaders which the spread of missionary education was already beginning to bring into being. He provided for the representation of native stipendiary magistrates. More

recently native medical practitioners have been appointed to the council; and discussions have continued as to means of making it representative of progressively widening sections of the community.

Since Gordon's time ceremonial has become less elaborate, and discussions have become more businesslike. But otherwise procedure had changed remarkably little. The most important part of the ordinary business consists in the debating of resolutions submitted from the provincial councils. Those which are carried are then referred to the government.

At first the council met every year, and, in addition to the members, a vast gathering of people from all over the islands gathered for the occasion. But these meetings caused a serious stoppage in the normal work of the country, and the hospitality required of the province acting as host made unwarrantable inroads upon its stocks of food. Ceremonial was therefore simplified; meetings were made triennial; and the place of meeting was made either Suva or Mbau. Changes in the country, however, such as the development of communications and the growth in the number of industrialized and urbanized Fijians, have made some central representative institution more necessary. Meetings have recently been biennial; and at the last meeting, in September 1942, a resolution was passed, and accepted by the government, favouring a return to annual meetings. The council has also returned again to its early practice of meeting in different provinces.

The pyramid of native authorities, based on the villages, with their headmen and assemblies of all the people, thus reaches its apex in the Great Council. Beyond it lies the central government. On the executive side this is represented primarily, so far as the Fijians are concerned, by the Native Affairs Department. This has from the earliest days of the colony maintained a paternalistic interest in those whom it rules—investing their money for them, buying their boats and training chiefs for their later tenure of high office by appointing them to clerical posts on its staff.

On the legislative side there is the Native Regulations Board, consisting now of the Adviser on Native Affairs, the Attorney-General and two chiefs. This was another of Sir Arthur Gordon's creations. Its purpose was to frame, under powers conferred by the Legislative Council, a code of laws in keeping with the desires and convictions of Fijian leaders for administration through the native authorities. Its object was attained perhaps almost too completely. For the board has often attempted the same minute supervision of

morals, as well as of all other aspects of life, which has characterized the work of purely native assemblies in other parts of the Pacific. Regulations made by the board are passed to the Governor for sanction and then to the Legislative Council for record. They are enforced through the native courts.

On the Legislative Council itself Fijians are, also represented. For this purpose the Great Council is required to submit the names of between seven and ten of its number to the Governor, from whom the latter selects five as members of Legislative Council. Formerly these native members took their seats rather reluctantly, seldom contributed to debates and in divisions showed an almost embarrassing loyalty to the government. During the last few years, however, under the leadership of Ratu Sukuna, as senior native member, they have followed a more active and more independent line. As the interests of the three communities—European, Fijian and Indian—have become more closely intertwined, the body which alone contains representatives of them all has become indispensable to them all.

Above the council is the Governor. His position is one of immense significance to the Fijians. They regard law as the command of the leader; and the authority of political bodies as drawn from above, not below. The Governor stands at the head of the hierarchy of chiefs, the representative of the Crown, under whose care they placed themselves at the time of cession. The more firmly he governs, the more completely is he fulfilling the role which is properly his according to Fijian ideas. The traditional marks of respect due to a high chief are still paid him.

The Fijian system of native administration is thus one of indirect rule in the strictest sense. It gives expression to the political ideas which have been handed down to the Fijians from the remote past. But its development has caused no real diminution in the powers of the European central government, since the adoption of Fijian ideas has involved the centralization of authority in the hands of those to whom the high chiefs voluntarily surrendered their political rights in 1874.

LAW, JUSTICE AND POLICE

As in other British colonies, the documents establishing the constitution extended to Fiji the common law, rules of equity and statutes of general application in force in England at the date on which a local legislature was first granted (2 January 1875). Since

that time the principal source of new law has been the Legislative Council. This has the power to pass Ordinances, which have the force of law when assented to by the Governor. In addition, acts of the British Parliament may be extended to the colony by specific enactment. Restricted powers of subsidiary legislation have been conferred on a number of bodies by the Legislative Council. The most extensive of such powers is possessed by the Native Regulations Board (pp. 183-4).

The highest judicial authority within the colony is vested in a Supreme Court, which is presided over by the Chief Justice. It possesses both civil and criminal jurisdiction. Criminal cases are normally tried by a jury of seven, when the accused is a European, or by a judge with the assistance of assessors when he is a non-European; the court's decision in both circumstances is final. For the hearing of civil cases the judge sits alone; and there is a right of appeal against his decision to the Judicial Committee of the Privy Council. Sessions of the Supreme Court are held at regular intervals in Suva, and the court also goes on circuit. Below the Supreme Court come the Magistrates' Courts, held by a resident Stipendiary Magistrate in Suva, by a travelling Stipendiary Magistrate in some of the more important industrial centres and by District Commissioners and District Officers elsewhere. They possess minor criminal and civil jurisdiction. Appeal from their decision lies to the Supreme Court.

In addition to these general courts there are native courts of two grades, with jurisdiction over natives only and concerned with the enforcement of the Native Regulations. The higher of these are the provincial courts, which are presided over jointly by a European administrative officer and a native stipendiary magistrate. Appeal from their decisions lies to the Supreme Court. The lower grade of native court is the district court. It is presided over by a native stipendiary magistrate alone. Its jurisdiction is limited to criminal offences involving maximum penalties of not more than £2 or than two months' imprisonment and to civil matters involving up to £4.

No branch of government in Fiji has undergone fewer formal changes since its first constitution than has the judiciary. Yet this fact conceals many notable advances in the manner in which judicial institutions have been operated. In earlier times the Chief Justice was required, in addition to performing his judicial duties, to participate in the executive and legislative work of government; and this system

resulted in several holders of the office becoming involved in bitter political controversies. The working of the Magistrates' Courts was also open to much criticism. Magistrates were often ignorant of the laws, and with poor communications no very close control from Suva was possible. Also there were difficulties in the working of the native courts, for it took time to develop methods acceptable to the Fijians and at the same time in conformity with European ideas of justice. But the passage of time has seen these faults gradually reduced or eliminated.

The police force and the administration of prisons has similarly increased in efficiency. There was perhaps to the European an atmosphere of primitive simplicity and to the Fijian a sense of new opportunity about the earlier situation. Prisoners were, on occasion, sent on long journeys without escort; and Suva gaol was even popular through the training obtained by 'working for the government'. Illegal acts often conferred no moral stigma on the offender in the eyes of his friends or his warders. Respected chiefs sometimes bragged even to Europeans of their experience of prison life. But punishment gradually became more rigorous; and native opinion has come—under missionary and official tutelage—to condemn many acts which it once freely condoned.

The police force at the present time is a mixed force of Fijians and Indians, partly officered by Europeans. Its authorized strength at the end of 1938 comprised 18 European and 3 non-European officers and 157 Fijian and 99 Indian non-commissioned officers and constables. It was divided into 19 detachments.

SOCIAL SERVICES

MEDICAL AND PUBLIC HEALTH SERVICES

The protection and improvement of the health of the people, both immigrant and native, was one of the earliest cares of the Fijian government. The breakdown of many Fijian practices relating to health or sanitation and the poor living conditions of the newly introduced Indian indentured labourers made an effective public health service a primary need. Similarly, medical services had to be provided by the government, since the small money incomes of the great majority of the population and the wide dispersion of settlement made the colony unattractive to private practitioners. These conditions still largely apply. In 1937 there were still only

four private registered medical practitioners; and the only private hospitals are small and poorly equipped.

Services are organized under a Medical Department, with a Director of Medical Services as its principal officer. In 1941 its staff was as follows:

Medical officers	21
Native and Indian medical practitioners	76
Sanitary staff	22
Trained registered nurses	55
Certificated non-European nurses	137
Other staff	75

Expenditure from public funds upon the services controlled by the department amounted, in the same year, to £108,000. In addition, the department has, in recent years, received substantial assistance from philanthropic institutions and private donors.

Public Health Services

Public health services are a responsibility of Town and Township Boards in the larger settlements and of *ad hoc* bodies and native authorities in rural areas. Their activities are co-ordinated and directed by a Central Board of Health. In most areas the more technical duties are performed by the district medical officers and native medical practitioners. For Suva and the principal sugar-growing areas of Viti Levu, however, special Medical Officers of Health have been appointed.

In addition to normal routine work, various special campaigns have from time to time been undertaken. One of the most important of these was for the installation of bore-hole latrines to limit the spread of hookworm. In collaboration with the Rockefeller Foundation, the Medical Department constructed latrines in villages throughout the group.

Hospitals

Before the improvement of communications Fiji had many small hospitals. During the last 25 years, however, there has been a gradual centralization. The principal hospital in the colony is the Colonial War Memorial Hospital at Suva. Here an attempt is made to maintain the general standard as regards staff, buildings and equipment, of a first-class general hospital in a more populous country. At present this hospital has 209 beds and cots. Considerable expansion was about to be undertaken at the beginning of the war, but has

been postponed. At Lautoka, Lambasa and Levuka there are also general hospitals, less well equipped than that at Suva, but able to deal with all ordinary cases. A few of the smaller hospitals of earlier years survive and, particularly in isolated areas such as the Lau group, continue to perform a useful service.

Native Medical Services

In 1884 the Fijian government began the bold experiment of training native Fijians as medical practitioners to work among their own people. The system proved an outstanding and increasing success. In 1928, therefore, with assistance from the Rockefeller Foundation, the training school at Suva was transformed into a Central Medical School for the Western Pacific. In 1940 the 51 students in residence comprised 18 native Fijians, 2 Fiji Indians, 9 Western Samoans, 1 American Samoan, 4 Tongans, 5 Gilbert and Ellice islanders, 4 Solomon islanders, 2 New Hebrideans, 1 Rotuman, 2 Cook islanders, 2 natives of Nauru and 1 of Niue. Enquiries regarding the admission of students have also been received from Guam and Pitcairn.

Except for the Cook islanders (most of whom have attended Maori colleges in New Zealand), few of the students have received more than a primary education. The Central Medical School is unique in that, in a course lasting four years, it provides men thus prepared with a specialized medical training.

Similar work for the training of non-European nurses has also been undertaken in Suva, under the direction of the general hospital. Recently the nursing school, too, has been reorganized, and since 1940 it has been functioning as a central institution for Pacific territories.

In Fiji native medical practitioners are at work throughout the colony. Only a small proportion are attached to hospitals. Most are stationed in rural areas, through which they travel constantly, attending the sick in their own houses, giving advice on public health matters and generally interpreting European medical ideas to their countrymen. Similarly many native nurses are employed in the villages as midwives and in advising Fijian mothers in the care of their children.

Central Leper Hospital, Makongai

The island of Makongai, in Lomaiviti, has been set aside as a leper asylum (Plate 35) for British island territories in the Pacific

and for New Zealand. In 1941 there were between 600 and 700 patients on the island. Fifty-nine new patients were admitted during the year—comprising mainly Fiji Indians and native Fijians—47 patients were discharged as cured and 45 more were awaiting discharge at the end of the year. Among patients who cannot be cured, a large proportion live on the island for many years. Out of 39 deaths during 1941 only 23 were due directly to leprosy.

The colony is directed by a resident medical superintendent, and the nursing staff of the hospital consists of members of the Roman Catholic Society of Mary. The standard treatment is the intramuscular injection of iodized chaulmoogra oil, but the hospital is constantly experimenting in new methods. Patients who are well enough are encouraged to work on the buildings and roads of the island, and receive normal rates of pay.

EDUCATION

Central Control

In the early years of the colony education was mainly the responsibility of the missions. In Suva and Levuka there were also schools for Europeans and mixed-bloods controlled by local boards. Two schools only were directly inaugurated by the government—a technical school in Suva and the Queen Victoria Memorial School, established in 1906, for the higher education of native Fijians. In 1916, however, an Education Department was formed. A system of inspection and of grants-in-aid to approved schools was introduced. The European schools in Suva and Levuka and the Queen Victoria Memorial School were placed under the department's control. The Lau provincial boarding school for Fijians was similarly transferred, and in the following nine years five schools of the same type were founded in other parts of the colony. The first government school for Indians was established in 1919. Further important changes beginning in 1929 resulted in the transfer of the main responsibility for education from the missions to the government. European teachers for government schools are obtained by secondment from the New Zealand teaching service; and most of the administrative positions in the department are also filled by New Zealanders. Government expenditure on education has grown from about £3,000 per annum in the years before the formation of the department to £62,689 in 1939.

The first thorough survey of literacy and of school attendance

was made in 1936. It showed that, of those over the age of 15, about 84 per cent. of native Fijians, 79 per cent. of mixed-bloods and 24 per cent. of Indians were literate. (The literacy of all adult Europeans was taken for granted.) Among those of school age, roughly two-thirds of native Fijians and mixed-bloods were recorded as actually attending schools; the proportion among Indians, however, was less than a quarter.

One of the major difficulties of the educational authorities in Fiji has been that of language. The present policy is to support the use of Fijian as the medium of instruction in the lower primary classes of Fijian schools and of Hindi in the same classes in Indian schools. Schools are encouraged to introduce English gradually, as a secondary language in the lower classes and then as the medium of instruction in the higher. Conditions in industry and in the towns are causing a considerable extension in the use of English. Already it is the medium of instruction in all classes in a few schools in the towns where members of several communities are taught together. The establishment of further schools of the same type may prove the means of satisfying the non-Hindi-speaking Indians, who object to their children being taught in an Indian language not their own. In secondary schools the use of English is general.

Primary and Secondary Education

In the towns there are a few 'mixed' schools where Fijians, Indians, Melanesians, Chinese and others are taught together. Certain mission schools also are open to all. But, in general, education is on a communal (or 'racial') basis.

Fijian Education. At the base of the Fijian educational pyramid are the village schools. These are controlled and financed by the people themselves. Some are under special committees, others under district or provincial councils. Money is raised by voluntary subscription or formal levies, or is supplied from provincial funds. Where a certificated teacher is employed, the government assists with a salary grant. Above them come a number of central schools, some under the control of native authorities, others under that of missionary bodies. They represent an attempt to increase the size of schools and so to make possible more effective teaching. In addition there are six provincial schools controlled by the government. These are boarding schools, each with accommodation for 90 or more boys. They take selected pupils from the schools of the neighbouring provinces at the age of from 10 to 12 and keep them until

they reach 16 or 17. They provide a primary, and to a limited extent post-primary, education, with a vocational bias. Each school has a European headmaster (who also acts as inspector of the village schools in his area) and a staff of trained Fijian teachers.

The only regular secondary school for Fijians is the Queen Victoria Memorial School, at Nasinu, near Suva, which takes between 80 and 90 boys, many of them holders of government or provincial scholarships. It has a European headmaster and European and Fijian assistants. Much attention has been given to adapting the curriculum of the school to local needs.

There are also in the colony schools offering specifically vocational training (p. 192). A few Fijian chiefs have sent their sons to schools in New Zealand or Australia.

Indian Education. Primary education is provided for Indians in 7 government schools, a number of schools controlled by the missions or the Colonial Sugar Refining Company, and schools managed by local Indian committees or Indian religious societies, such as the Arya Samaj and Sanatan Dharma. In addition to the language problem, there have been other hindrances to the rapid development of Indian education. Important among them have been the difficulty of providing schools for Indians along in the more sparsely settled parts of the colony, the tendency of parents to keep their boys at home when there was work to be done on their farms and not to send their girls to school at all, and the widespread dislike of co-education. There has also been a difference of opinion as to general policy between many Indians and the government. The former have desired extension of government control of schools, combined with the introduction of a special education rate; the government, on the other hand, has remained in favour of privately controlled schools and the grant-in-aid system.

Secondary education is provided in the government Indian secondary school at Natambua, near Lautoka. This is a boarding and day school and offers, in response to the popular demand, a more 'academic' education than any of the schools for Fijians. In Suva some Indian boys receive a similar education at the Roman Catholic St Felix College.

European Education. In Suva and Levuka there are government primary schools for Europeans; in the other principal settlements there are similar schools conducted by the Colonial Sugar Refining Company, the Emperor Gold Mining Company, or local committees; other European children are catered for by correspondence classes.

In addition there are Roman Catholic boarding schools for both boys and girls.

At Suva there are boys' and girls' grammar schools, each with a boarding department. Many Europeans, however, send their children to secondary schools in New Zealand or Australia.

Until recently no special provision has been made for the education of mixed-bloods. Many attend the 'European' schools, but these have not provided for children living in isolated areas, for children unable to speak English or (owing to the powers of exclusion possessed by governing bodies) for children of parents who do not maintain a more or less European manner of life. A first step has recently been taken towards dealing with this problem by the foundation of a government school, mainly for mixed-bloods, at Savusavu, on the south coast of Vanua Levu.

Vocational Education

Facilities for vocational training are fairly widely distributed in Fiji. Agricultural schools are maintained by the government, the Methodist mission and the Colonial Sugar Refining Company. The government and the three principal missionary bodies conduct teacher-training schools; and the latter also provide theological training. There is a government school for the training of wireless operators at Suva, where also are situated the important Central Medical and Nursing Schools.

In addition there are several institutions offering training of a more general kind for many occupations. The oldest of these is the Methodist Technical School, at Ndavuilavu. This has an enrolment of from 140 to 150 Fijian boys, who are trained for a variety of technical occupations—including building and printing—and for clerical work. Covering somewhat similar ground is the recently established government Technical Centre in Suva.

The few desiring university education have to go abroad for it—normally to New Zealand. A number of such students have been assisted by scholarships or grants from the government or the provincial councils. There is a hope, however, that with the Central Medical School, the Queen Victoria Memorial School and other existing institutions to build on, it may eventually be possible to create in Fiji, if not a university, then an institution such as Achimota College in the Gold Coast, which would serve not Fiji alone but all the Western Pacific territories.

RELIGIOUS ORGANIZATIONS

In most parts of the Pacific the religious affiliations of the people still clearly reflect early missionary activity. In Fiji missionary enterprise was marked by the preponderance of Protestant as against Roman Catholic mission work and by the consent among Protestant bodies that the group should be the special charge of the Wesleyan Methodists. According to 1936 census figures, the Methodist mission—a branch of the Methodist Missionary Society of Australasia—could then count as adherents 88 per cent. of native Fijians, over 50 per cent. of mixed-bloods and of Indian Christians and over 40 per cent. of Melanesians. It is active throughout the group, and has churches or regular preaching places in many hundreds of villages. Next, in number of adherents, comes the Roman Catholic mission—under the charge of the Marist order—with a following of 10 per cent. of native Fijians, about a third of the mixed-bloods and a generally minor proportion of the other communities. In addition to about 75 smaller churches there is a Roman Catholic cathedral in Suva. The Seventh Day Adventists have also been active among Fijians for many years, but they have never succeeded in attracting more than from 2,000 to 3,000 followers. The Anglican and Presbyterian churches are concerned primarily with serving the religious needs of the European community, and much of their work centres upon their churches in Suva. Since the days of the labour traffic, however, the Anglicans have also worked among the Melanesians in Fiji, as a natural extension of their work in the islands from which the immigrants had come; and more recently they have undertaken a mission to the Indians. This work is conducted only on a comparatively small scale.

With the development of the colony the missions have been able to withdraw gradually from much of their non-spiritual activity. In particular, the former Methodist control of the majority of village schools has disappeared. Mission concern for education is, however, by no means a thing of the past. Apart from some ordinary elementary schools still under their control, they maintain many special schools of considerable importance to the colony (pp. 191-2).

Compared with Christian missionary activity, the work of Hindu and Moslem religious bodies is still in its infancy in the colony. They are, however, taking an increasing part in the life of the Indian community and, like the Christian missions before them,

are joining educational work with the performance of their more strictly religious functions.

THE PRESS AND BROADCASTING

Fiji has possessed a local press for more than seventy years. At present the leading Suva publishing firm produces several papers: a daily, *The Fiji Times and Herald*; a weekly in English for general circulation in Western Pacific territories; and also weeklies in Fijian and Hindustani. There are also several other weekly papers, including one published at Levuka. The government publishes monthly journals for Fijians and Indians, in addition to an *Agricultural Gazette* and the official *Fiji Royal Gazette*. The three principal missions all issue monthly journals.

At Suva there is a broadcasting station operated by a private company under licence from the government. It uses the call-sign ZJV and transmits on a frequency of 920 k.c. (326 metres). In addition to musical programmes there are daily news sessions (including rebroadcasts from Great Britain and Australia). The station is also used by the government for the transmission of programmes of a broadly educational character in Fijian and Hindustani.

ECONOMICS

Fiji with its metal-bearing rocks, its damp tropical climate and rich volcanic soil, possesses a wealth of economic resources ranging from gold to sugar and copra. The chief hindrances to their exploitation in the past have been shortage of labour for mines and plantations and the reluctance of foreign investors to provide capital except for the sugar industry and for gold mining. The native Fijians have always maintained a small-scale subsistence agriculture supplemented by fishing. Plantation agriculture began about 1860 and still continues, though on a diminished scale since the ending of indentured labour in 1916. From that date till today estate agriculture has been largely supplanted by small-scale production by Indians and Fijians for the export market. It is only in the last ten years that gold has been mined, though by now it is the second largest export.

MINERAL RESOURCES

With the widespread distribution of igneous rocks it is natural that metalliferous deposits should occur. Their extent is as yet



Plate 20. Banana-packing station on the Waindina river

A centre to which native growers bring their fruit by boat for packing under government supervision.



Plate 21. Indian farm, near Lambasa, Vanua Levu

The buildings on the left show the simple standard of housing common on Indian holdings.



Plate 22. Locomotive on the C.S.R. Company's railway, Lautoka

The engine burns wood and so is fitted with a spark-catcher; it is drawing a truck loaded with sugar cane.



Plate 23. Sugar mill at Lautoka

Cane is being unloaded from trolleys on to a belt conveyor which takes it to the crushing rollers.

unknown as no thorough geological survey has yet been made. The presence of gold has been known for some time. Commercially paying quantities were discovered in 1931 in ores of barium sulphate at Yanawai on the south coast of Vanua Levu (Fig. 54). Mining by Mount Kasi Mines, Ltd., began in 1932, when 311 oz. were produced. Production in 1933 reached 1,944 oz. A further discovery was made in 1932 on a tributary of the Nasivi river, south of Tavua, on the northern side of Viti Levu, the ore occurring in augite andesites. Two large concerns, the Emperor and Loloma companies, work neighbouring mines (Fig. 65); and three smaller producers are also operating. By 1943 production had been begun by two syndicates in a third area—the Vunda district, near Lautoka—and prospecting was continuing in other parts of both Viti Levu and Vanua Levu. The United States buys the annual output, which in 1940 was valued at £1,024,923.

Asbestos of short staple is reported near Suva; and traces have been found elsewhere of lead, tin, zinc, nickel and iridium. Small phosphate deposits occur on Vatoa, Ongea Ndriki and others of the Lau islands, but have not so far been worked for export.

TYPES OF AGRICULTURE

Historically there have been considerable changes in the types of agriculture current in Fiji. Native Fijian agriculture, an economy based originally on subsistence and local exchanges, has become a mixed economy; with the introduction of cash and the inclusion of the group within the orbit of world trade, a growing, though still relatively small, part is played by production for world markets.

From about 1870, when cotton growing had become well established, until twenty years ago, Fiji was primarily a region of plantation agriculture. In recent years, however, this has given way in regard to sugar cultivation to a novel system of tenant farming by smallholders, and, in regard to copra and bananas, its importance has greatly diminished, leaving the field to small-scale Fijian production.

The Indians, introduced originally as labourers, have now gained their independence and become small farmers as tenants of the Colonial Sugar Refining Company or of Fijians. Thus in terms of scale and organization of production, Indian farming is comparable with Fijian.

FIJIAN AGRICULTURE

An outline of the traditional organization of Fijian farming has already been given (pp. 158-9). Essentially it is based on a clan system of land tenure whereby individual families enjoy the usufruct

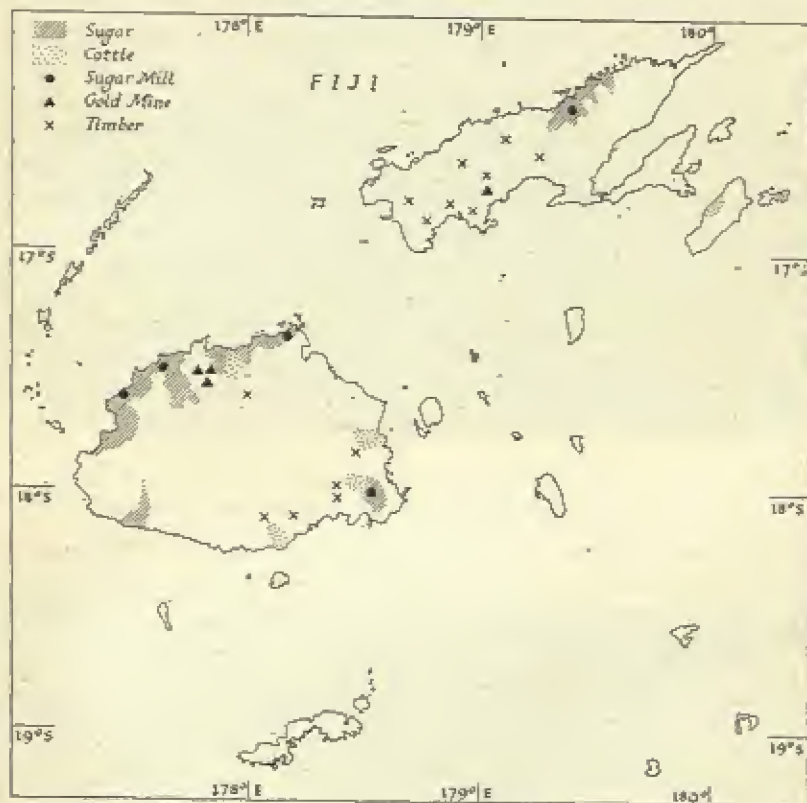


Fig. 54. Land utilization in Fiji (1)

The term 'cattle' includes stock cattle on coconut plantations in Taveuni and dairy cattle in Viti Levu. Small numbers of cattle are kept by farmers (especially Indians) in other areas not marked on the map. Based on map no. 5 in *A Report on the Fiji Census, 1936* (Suva, 1936). Projection as in Fig. 42.

of the land they cultivate. No statistics of quantities thus grown are available, though enough is produced to meet the needs of the Fijian population, including the exceptional consumption at feasts. Hurricanes and floods cause rare and temporary shortages. This purely traditional type of subsistence agriculture is rarely met with

today except in times of economic depression or in remote areas unsuitable for export crops or too far from communications. It is far more usual to find that some quantity of export crops, whether copra, bananas, pineapples or sugar cane, is grown in addition to the fruit and vegetables for home needs. The production of exportable surpluses and the growing of new crops specially for export have long been urged on the Fijians by missionaries and government alike. Taxes and contributions to mission funds are largely met by the sale of agricultural produce.

The small group of Fijians exempted from communal duties (some 700 in number) also produce a mixture of subsistence and export crops. Their system differs from that of the bulk of Fijians in respect of land tenure, since they are freed from responsibilities to a land-owning group; in respect of supervision and advice, they have closer contacts with the government agricultural stations and advisers, as is shown by the details of their crops and stock. In the provinces of Naitasiri, Rewa and Tailevu, in 1938, 91 exempted men cultivated a total of 342 acres—i.e. an average of $3\frac{1}{2}$ acres per man. The following figures relating to the provinces of Nandi, Nandronga and Tholo West may be cited as typical of those for many areas:

'Exempted' Farmers in Nandi, Nandronga and Tholo West

Farmers	172	Houses	243
Dependents	991	Stock-yards	48
Cattle (head)	1,479	Yams (acres)	77
Horses "	705	Yanggona "	44
Pigs "	176	Taro "	41
Poultry "	1,206	Tobacco "	18
Sugar (acres)	123	Plantain "	18
Rice "	92	Bananas "	15
Maize "	78	Cotton "	9
		Sweet potatoes "	8

Based on: H. W. Jack, 'Progress in Field Agriculture among Fijians', *Agricultural Journal*, vol. ix, p. 3 (Suva, 1938).

Local surpluses of fruit and vegetables find a ready sale in the towns.

Cash incomes of Fijians are difficult to estimate accurately. Some 8,000 are employed as wage earners; individual earnings vary from 14s. to 25s. per week. Income from other sources in 1938 was estimated at £278,238. Of this, £176,732 was derived from the sale of copra, £28,848 from sugar, £32,658 from bananas and £40,000

from the rent of lands. Thus, ignoring wages, these figures give an average of about £2 16s. per head or £11 4s. per family of four. Fijian dairy farmers have been reported to earn as much as £300 a year.

CROPS

Cotton

Cotton growing in Fiji is now merely of historical interest (pp. 134-6). Production rose from 12 tons valued at £360 in 1862 to a peak valued at £92,700 in 1870, but three years later fell to almost nothing. A revival on a small scale occurred from 1923 onwards when the government set up ginneries to handle the crop, but production has now ceased again. During this period cotton growing was mainly in the hands of Indians. The annual export for the period 1923-33 averaged about £8,800.

Coconuts and Copra

Coconut palms grow with little attention all round the coasts of the main islands (Fig. 55) and almost cover some of the smaller ones. The nuts from such groves have always been sources of food and drink to the Fijians and also used to provide the coconut oil with which they anointed their bodies. Encouraged by the missionaries, they produced a surplus of oil for sale to traders in the middle years of the last century. By 1880 European copra estates were established, and at about the same time the oil export came to an end. The estates, which arose as an alternative investment after the failure of cotton in 1873, developed rapidly. The annual export rose from 3,781 tons of copra in 1875 to 10,908 tons in 1895. Figures of copra exports over the period 1915-40 are given in Fig. 59. Estate production continued on a high level till the economic depression of 1932.

For many years native production has been growing steadily as Fijians soon copied the estates in producing copra instead of oil. Since the 1932 economic depression, two-thirds of the copra exported from the country has been produced by Fijians, who do not have to bear the heavy labour costs and the problems of labour shortages incurred by the estates. Prices obtained for the native product are low, reflecting its poor quality.

The total area under coconut palms, including plantations and small-holdings, was estimated at about 30,000 acres in 1929-30. Average areas of coconuts per man under the clan system of

tenure cannot be ascertained, but for exempted men an average of 15 acres has been estimated, with a total yield of 4 tons of copra per annum. In 1938 when copra prices were at the very low level of £5 5s. 6d. per ton, Fijians who did their own work and grew their own food could produce copra remuneratively, while few European

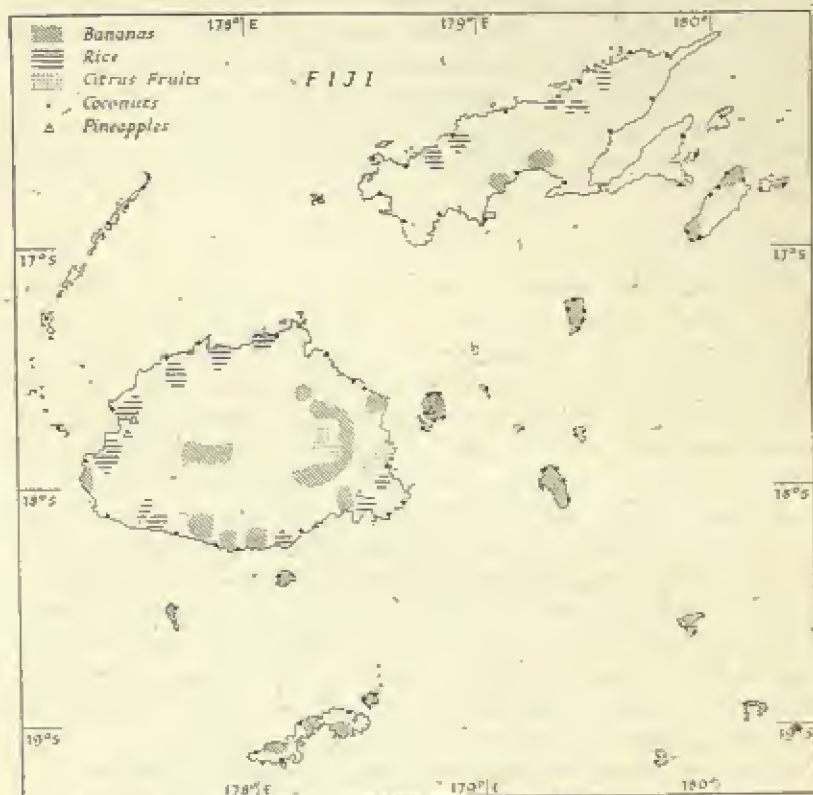


Fig. 55. Land utilization in Fiji (2)

In addition to the products shown, sweet potatoes, tomatoes, *bêche-de-mer* and trochus shell are exported. Tropical fruits and cassava, taro, peanuts and *yanggona* are grown for local consumption. Based on map no. 5 in *A Report on the Fiji Census, 1936* (Suva, 1936). Projection as in Fig. 42.

estates could produce at a profit. In 1939 it was estimated that a Fijian could obtain a cash income of £4 per month from the sale of his copra.

The technique used by the estates in the early days of the industry was that of sun-drying; but the climate is too humid to ensure

success by this method, and today large kilns of the Malayan type are used, employing hot air from a fire of coconut shells.

Though the government has been unable to solve the economic problems of the coconut planter, it has great achievements to its credit in the fight against insect parasites, particularly in the case of the purple moth (*Levuana iridescens*), the coconut scale (*Aspidiotus destructor*) and the coconut spathe moth (*Tirathaba spp.*). The first of these has been almost completely exterminated by a parasitic fly introduced from Malaya; the second has been similarly checked by an imported ladybird; the coconut spathe moth has been attacked by a species of wasp (*Apanteles tirathabæ*) brought for the purpose from Java.

Sugar

The cane sugar industry, first established in 1873, has been since about 1880 the most important single factor in Fiji economics. In that year it was demonstrated that sugar would granulate in the Fijian climate. Plantations were begun in the Rewa valley. The first large estate and mill to be opened was the Penang Sugar Estate, situated on the coast of Ra province, Viti Levu. In 1880 the Colonial Sugar Refining Company of Australia (commonly known as the C.S.R. Co.) began operations in Fiji, establishing a mill at Nausori on the Rewa delta. Other mills quickly followed—a second at Mba in 1883, a third at Lambasa in Vanua Levu in 1897 and a fourth at Lautoka in 1901. From the outset the C.S.R. Co. were cane growers as well as sugar refiners, and by their command of capital gradually ousted the individual planters. A mill opened in 1906 by the Vancouver-Fiji Sugar Company at Navua, in the south of Viti Levu, was closed down in 1922.

The main sugar areas and mills now in operation are shown in Fig. 54. With the exception of the Rewa delta area, these are all in the dry zones where, though cane does not grow so luxuriantly as in the wet zone, its sugar content is much higher. Fig. 66 shows the distribution of narrow-gauge railways built by the company for the transport of cane to the mills. The annual capacity of the mills is approximately as follows: Penang, 10,000 tons; Lambasa, 20,000 tons; Nausori, 20,000 tons; Rarawai, 48,000 tons; Lautoka, 62,000 tons. This gives a total for all mills of 160,000 tons. The peak production, reached in 1937, was 149,000 tons. The mills (Plate 23) employ many Fijians as unskilled labour and Indians for the operations needing more skill; the higher technicians and managers are

all Europeans. The plantations, factories and plant of the company represented a capital value of about £3,000,000 in 1936.

The estimated yearly cane production of the 13,000 Indians engaged in the sugar industry in 1930 was valued at about £53 per head. Fig. 56 gives the production and acreage of cane for the period 1915-40. The relatively low productivity per acre up to 1927 reflects the labour scarcity before the tenant-farmer system had been fully developed. Since that date the area in cultivation has, with the operation of international controls, remained fairly constant,

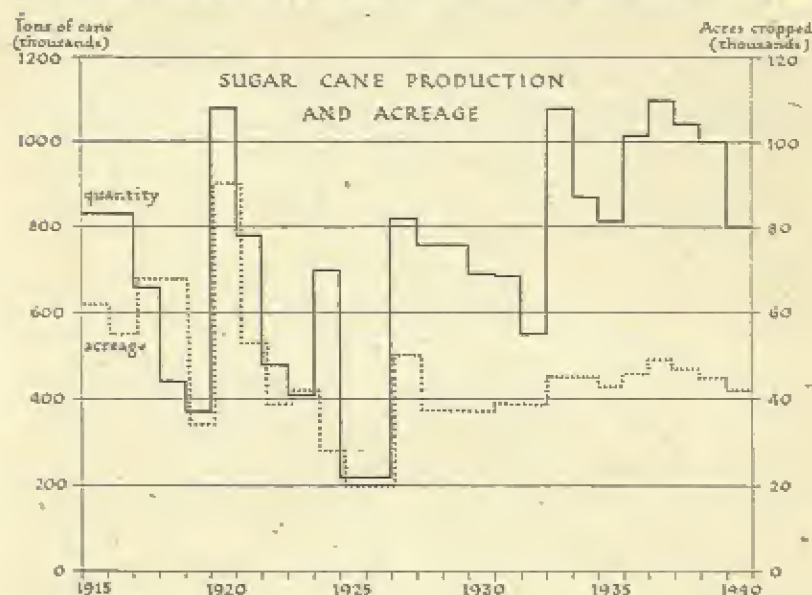


Fig. 56. Sugar-cane production and acreage, Fiji, 1915-40

Based on tables of agricultural production in the *Fiji Blue Book* (Suva, 1916-41).

while the productivity has tended to increase. The minimum export of 44,472 tons occurred in 1924 and the maximum of 140,864 tons in 1936 (Fig. 57). Molasses, a by-product in the manufacture of sugar, is used as stock feed partly locally and partly in Australia and New Zealand. Amounts exported over the period 1919-40 have averaged 13,000 tons yearly.

In the early days the industry relied on indentured Indian labour. After 1916 when fresh supplies of such labour ceased, the C.S.R. Co. began to lease 10 to 12 acre lots of land to Indians whose terms of indenture had expired. The company provides the farmer with

credit, lends him the more costly implements, supplies him with information on the best methods of cultivation; it purchases his entire crop at fixed prices. In return it imposes fairly stringent conditions as to his use of the land: crops other than sugar cane may not be grown; a fixed system must be followed in regard to planting and cultivation; and the holding must be so laid out as to

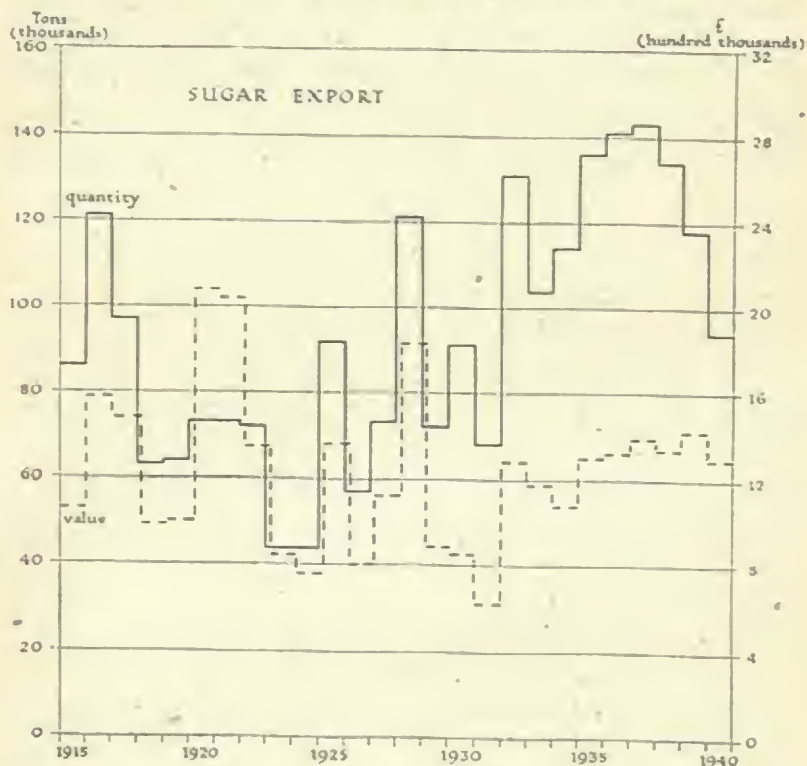


Fig. 57. Export of sugar, Fiji, 1915-40

Based on: (1) Colonial Office *Annual Report* for 1915-38 (London); (2) *Fiji Blue Book* (Suva, 1940-1).

facilitate large-scale harvesting in combination with neighbouring farms. About half the total of 8,900 sugar cultivators lease land from Fijians. Holdings vary between $2\frac{1}{2}$ and 12 acres in area. Cultivation is sometimes good but often considerably below that on company leaseholds; and cane growing is often combined with the growing of other crops. Even here, however, the influence of the company is strongly felt. Its overseers are available to give advice; and

in some cases it has refused to buy cane unless its stipulations are obeyed.

Bananas

Bananas were grown extensively as a plantation crop in the first two decades of the present century. Climate and soil are very suitable, but pests, diseases and marketing difficulties have severely handi-

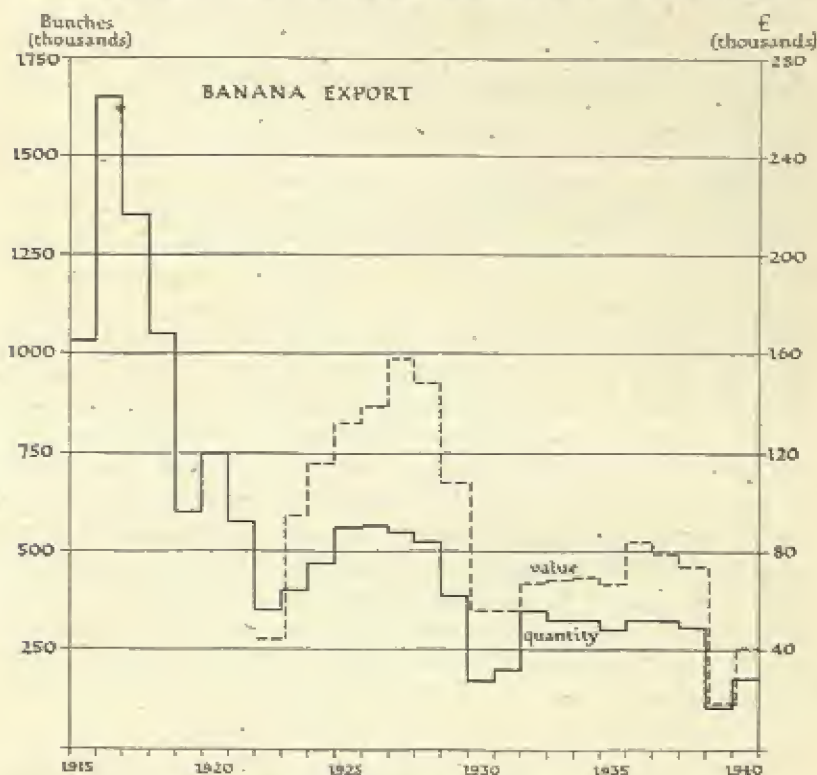


Fig. 58. Export of bananas, Fiji, 1915-40

Some of the annual totals have been converted to thousands of bunches on the basis of 1 case being equivalent to 2 bunches. Based on same source as Fig. 56.

capped the industry. In 1914, 1,715,766 bunches were shipped to Australia and New Zealand, but shipping strikes and the imposition of a high import tariff by Australia have severely curtailed the export, which fell to 169,000 bunches in 1930. Since then, the reduction of Australian tariffs and the institution of a quota system of export to Australia and New Zealand have improved the marketing situation;

but the European planters have largely withdrawn, leaving the field to Fijians who by 1937 were producing 95 per cent. of the fruit exported, some of which now goes to Canada. Fig. 58 shows the decline in banana exports over the period 1915-40.

Although the marketing of this fruit is in the hands of European firms, there is strict government control; prices are fixed by agreement with the government of New Zealand. Buyers pay for the fruit in cash at the time of delivery, provide cases and transport to Suva and meet all charges. Transport in the early stages is often by river (Plate 20). The main areas where bananas are grown are shown in Fig. 55.

Pineapples

Small quantities of pineapples have long been grown by Indian and Fijian small-holders, the fruit being consumed locally and exported in small quantities to New Zealand. Climatic and soil conditions are similar to conditions in Hawaii, so recently various attempts have been made to start large-scale plantations and canneries. The government led the way in 1926 by arranging for small quantities to be produced and exported to test the reactions of the markets in America and Europe. The experiments were successful; but two private ventures begun in 1928 and 1930 were a failure. In 1936 the C.S.R. Co. turned to pineapple growing in Nandi province and began canning in 1938. The latest figures of exports of canned pineapples—134,000 lb. in 1938, 520,000 lb. in 1939 and 499,000 lb. in 1940—represent the product of the company's cannery and of another small one on Ovalau. Most is exported to New Zealand. There is also a small export of canned pineapple juice.

Rice

Rice growing has been from the first an Indian occupation. In the early period of their settlement much of the rice was imported, but particularly since 1919, when the cost of imported rice was prohibitive, Indians have grown a great deal themselves. A government rice mill was erected in 1921. By 1937 the average annual production of padi (unhusked rice) was about 11,500 tons (equivalent to about 8,500 tons of husked rice). Yet even so, the average annual import of rice for the period 1922-37 was about 1,300 tons.

The chief rice-producing areas correspond with centres of Indian settlement.

Principal Rice-Growing Areas, 1938

<i>Viti Levu:</i>	<i>Acres</i>
Singatoka and Nandi	3,500
Lautoka	3,050
Mba	3,952
Tavua	650
Ra	1,000
Rewa, Tailevu and Suva	1,500
Navua	1,200
<i>Vanua Levu</i>	1,500

Based on: Colony of Fiji, *Legislative Council Paper*, no. 34, 1939, p. 4.

In Tailevu the average acreage per cultivator is 1.7. Assuming an average yield of 14 cwt. per acre, at the 1938 price of £8 per ton of padi, the profit to the grower has been estimated at £1 7s. per acre.

Both the wet and the dry types of rice are grown, roughly in the proportions of 90 per cent. wet to 10 per cent. dry. The land chosen for wet rice is generally too damp to grow other crops successfully. Artificial irrigation is not practised. Rice is husked in the government mill and in over forty small privately owned mills with average capacities of about 2 tons of rice per day.

Rubber

Para rubber thrives in the wet zones of Fiji. It was introduced as a plantation crop by the Department of Agriculture in 1906; by 1919 about 2,000 acres had been planted by European planters. About 13 tons were exported in 1915, and production continued to rise, except during the severe slump of 1921-2, reaching the peak figure of nearly 100 tons in 1929. Since then until the present war prices were so low that none was tapped.

STOCK RAISING AND DAIRYING

Pigs, which have long been kept by Fijians, are also kept by Europeans. Formerly they had free run, and only recently has breeding on scientific lines been carried out; the white breeds are the most popular. The first cattle were landed at Rewa in 1834; since then many British breeds and the Indian zebu type have been introduced. Cross-bred zebu bullocks have proved the best for draught purposes. Sufficient beef is produced for all local needs. On coconut plantations cattle are kept to graze down the undergrowth, the supply of

meat being a secondary consideration. The Indians everywhere keep cattle as a source of milk and *ghee*. Among Fijians the encouragement of milch cattle keeping is a cardinal feature of the government child welfare campaign. To give some idea of the numbers kept, the example may be cited of twenty-seven 'exempted' men in Mbua province, Vanua Levu, who in 1938 owned altogether 26 working bullocks, 12 milking cattle and 12 horses. Horses are bred successfully and provide hacks for use on the bridle tracks of Fiji and heavier types, including the Clydesdale and Suffolk Punch, for tillage. Sheep were first imported by Dr Brower, the United States commercial agent, in 1860, and steadily increased in numbers till 1880. But from then on their numbers decreased; further attempts at introduction merely temporarily arrested the decline. Parasitic infestation and the ravages of dogs are held to have been the chief adverse factors. Most of the goats in Fiji are kept by Indians, though a few estate owners rear them for their own consumption.

The total numbers of livestock in the islands in 1940 were estimated to be as follows:

Cattle	75,000
Horses	14,000
Pigs	4,500
Goats	26,000
Sheep	480

Dairying has been developed on a large scale and to a high degree of efficiency since 1918. In that year the government, realizing the potentially favourable climate and pasturage of Fiji, began a settlement scheme for soldiers returned from the war. About twenty men were established in Tailevu province on 6,000 acres of virgin land. As soon as pasturage became available, cattle were distributed among the new farms and a butter factory built in 1922. The butter produced was of fine quality and commanded a ready sale locally. This scheme was followed by the erection of two private butter factories: those of the Rewa Co-operative Dairy Company on the Rewa and the Fiji Pastoral Company at Navua. The Tailevu scheme has now been amalgamated with that of the Rewa company. From 1929 imports of butter have almost ceased and the surplus production of the factories has been converted into *ghee* which is in great demand among the Indians. The 1936 figure for butter production was 530,250 lb. and that for *ghee* 152,153 lb.

FORESTRY

About half of Fiji—i.e., about 2,300,000 acres—is covered with forest. This contains many types of valuable timber, both hardwoods and softwoods; but exploitation has been limited by the inaccessibility of much of the forest and by the fact that large stands of any one species seldom occur. Nevertheless, it has been estimated that about 4,000,000 superficial feet of all kinds are cut annually, while the consumption of mangrove wood for fuel is put at 20,000 tons per annum. In 1931 the annual consumption of timber was about 70,500 tons, of which the local forests produced 58,000 tons. By 1940 two timber concessions, covering 40,000 acres, had been granted.

The chief woods of commercial value today are *mbuambua* (*Guettarda speciosa*) and *vesi* (*Intsia bijuga*), both hardwoods; and *ndakua* (*Agathis vitiensis*), a softwood almost identical with the New Zealand kauri. The gum of the last is tapped by Fijians and its export had risen from 30 tons to over 300 tons in 1938.

FISHERIES

Although the waters of Fiji abound in fish, no organized fishery on a commercial scale has ever been attempted. The Fijian methods described earlier are still pursued, though with the attraction of new varieties of foodstuffs, including imported canned fish, they have tended to decline in importance. There is a small annual export of trochus shell which before the present war went mostly to Japan and France for the manufacture of 'pearl' buttons. Small quantities of *bêche-de-mer* were also exported. The collection of both these products is in the hands of Fijians. Frequently the export of trochus shell has ranked fourth by value in the annual exports; for instance, in 1925 it was valued at £36,000. Marketing conditions have, however, always been uncertain.

Fishing by Europeans for sport is carried on both in the rivers and in the sea. Large marine game fish such as the swordfish, barracuda and albacore give good sport.

MANUFACTURES

Beyond the processing of sugar and copra and the making of butter, there are few local manufactures. Soap and biscuits are made in

Suva for local consumption and export to other island groups in the Pacific. Boat building is also carried on at Suva.

THE LABOUR SITUATION

Scarcity of suitable labour has always been the chief obstacle to large-scale economic enterprises. The unwillingness of Fijians in the past to work for wages led to the importation of other Pacific islanders and of Indians. With the ending of the indenture system, few Indians have been willing to remain as wage-earners. They have, in general, preferred to establish themselves as independent farmers, small shopkeepers, taxi-drivers, etc. The attitude of Fijians towards wage-labour has tended to change with the opening of wider opportunities and with the freeing of some of the men from communal responsibilities. While most have, like the Indians, chosen to work for themselves on their own lands, some have been attracted by the wages and conditions of work as wharf labourers, seamen, carpenters; or government officials, school teachers, mission workers, etc.; or else in the gold mines or in small industrial undertakings. The total thus employed in 1937 was between 7,000 and 8,000. Seventy-five per cent. of the labour in the gold mines in 1938 was Fijian. Wages in the mines in 1939 ranged between 14s. (unskilled) and 25s. (skilled) per week, quarters and rations being provided. Wharf labour in Suva was paid at the rate of 3s. 6d. per day, plus meals.

TRADE

Since Fiji is essentially an agricultural country, it follows that its export trade consists mainly of the principal crops of sugar, copra and fruit. During the last five years, however, gold production has risen to such an extent that it is now second only to sugar. Export trends for sugar, bananas and copra are shown in Figs. 57, 58 and 59.

Over the last ten years the bulk—about 80 per cent.—of these exports have, with the operation of imperial preference, been marketed within the Empire. Fig. 60 shows their main destinations in the years 1915, 1925 and 1938. It will be noted that Australia and New Zealand, the local markets, absorbed a high proportion in the first two of these years. Normally, New Zealand took the larger proportion, owing to the exclusive tariff policy of Australia. But, since New Zealand offered a relatively small market for sugar and was bound to take large quantities of fruit from the New Zealand dependencies, Fiji has increasingly turned to Canada as a market for

both these commodities. The bulk of the sugar, however, is exported to the United Kingdom. All the gold produced is now exported to the United States. The striking increase in exports to the United

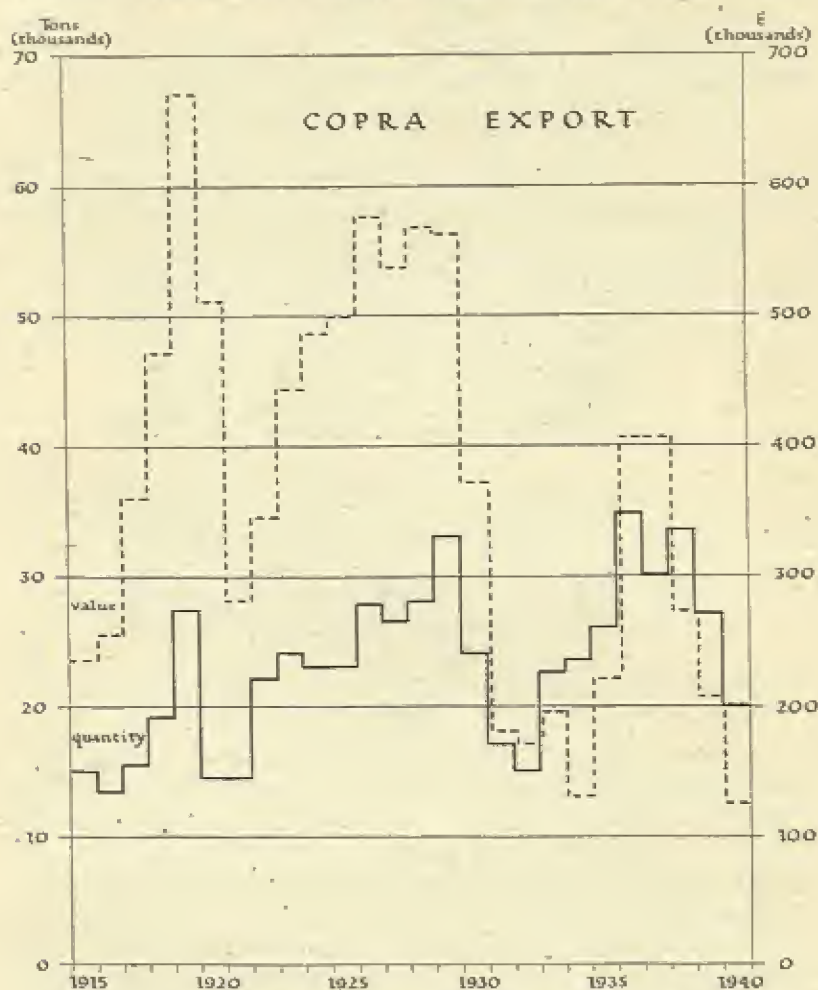


Fig. 59. Export of copra, Fiji, 1915-40

Based on same source as Fig. 56.

Kingdom between 1925 and 1935 is attributable to improved shipping facilities and to the Ottawa Agreement of 1932. The largest consumers of Fijian copra have been the United States and European countries. These exports have been severely affected by

the present war. Acute shipping shortage meant that for some months in 1940 copra was unsaleable. The government met this situation by contracting to buy all copra produced and assuming the responsibility of providing shipping.

Over the period 1918-38, imports have ranged between a minimum of £857,000 in 1932 and a maximum of £1,760,000 in 1938. The largest group of items has long been foodstuffs. Most of this consists of traditional items of European and Indian diet which are not produced within the colony. Flour, sharps, meat, whisky and tea are large items. Next in importance is drapery, since no textiles are

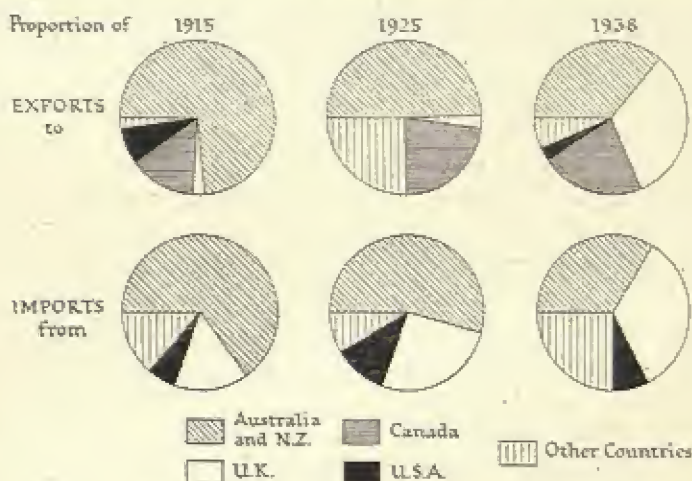


Fig. 60. Changes in foreign trade of Fiji between 1915 and 1938

Based on summary tables of exports and imports in *Fiji Blue Book* (Suva, 1916, 1926, 1939).

produced locally. This is closely followed by hardware, machinery and motor vehicles.

The internal trade of Fiji presents the usual picture of a few large firms centred in the capital with agents scattered through the provinces and a number of small traders in competition with these. The firms of Morris, Hedstrom and Co., Ltd., Burns, Philp (South Sea) Company, Ltd. and the Jang Hing Loong Co., have stores in all the main population centres and agents in the small village shopkeepers scattered throughout the group. From them the rural population obtain their supplies of tinned foods, lamp oil, matches, calico, etc. Payment is made in cash or in some cases in raw copra.

BANKING AND CURRENCY

There are two private banks in the colony. The Bank of New South Wales has branches at Suva, Levuka and Lautoka and agencies at Mba, Tavua and Nandi; the Bank of New Zealand has a branch at Suva. There is a Government Savings Bank, opened in 1908; accounts at the end of 1938 numbered 12,945, with about £350,000 on deposit.

Legislation in 1933 and 1934 provided for the issue of government currency notes and coin in United Kingdom denominations. The Fiji penny and halfpenny, nickel coins, have central holes so that natives can carry them on a string. The Fiji pound is linked to sterling at the rate of £F111 to £100 sterling.

PORTS AND SETTLEMENTS

SUVA

Suva (Fig. 61, plates 24-6), capital of Fiji and seat of the High Commissioner for the Western Pacific, is situated in the south-east of Viti Levu, approximately in lat. 18° 08' S, long. 178° 26' E. The population of Greater Suva (the town and its immediate surroundings) was about 16,000 in 1936.

The development of cotton growing in the Rewa valley from 1860 onwards drew attention to the desirability of Suva with its large reef-locked and sheltered harbour as the ultimate site for the capital. In 1868 the Polynesian Company of Melbourne obtained rights to the land by a charter from King Thakombau. In 1882 the government moved the capital to Suva from Levuka. Port facilities at Suva at that time were limited. A wharf known as the Queen's Wharf, projecting from reclaimed land south of the Numbukulou creek, was completed in 1882, but by 1900 this had decayed and was replaced. In 1902 the increasing commercial importance of the port necessitated an extension of 80 ft. to accommodate 4,000-ton steamers. In 1913 work was begun on an ambitious scheme of reclamation and reconstruction, embodying the present King's Wharf and the reclamations to the north of it, and the Queen's Wharf was pulled down. By 1939 it was felt that further expansion was needed.

The approach to Suva from the east offers no difficulty to steamships or sailing vessels, but in the trade wind season sailing vessels

approaching from the south are advised to steer well to the windward of Kandavu and the Astrolabe reef.

Detailed Description of the Port

The entrance to the harbour, protected from the prevailing wind by land 200 ft. high to the east of the bay, is through a passage between an extensive fringing coral reef on the west, which is partly dry at low water, and the incurving end of the barrier reef on the east, which does not uncover. The channel has a length of about $\frac{3}{4}$ mile and a width of 1,800 ft. There is a depth of 40 fathoms in mid-channel. The bottom consists of patches of sunken coral, sand and mud. Off the northern end of the barrier reef are detached coral patches, the most easterly being Thurston patch with a depth of $4\frac{1}{2}$ fathoms. There is a second entrance between the barrier reef and Suva point on the east side of the harbour, but it is narrow and suitable only for small craft, though ships up to 500 tons have used it.

The harbour is in two parts. The main harbour, lying to the east (Plate 30), has an area of about 1,500 acres of clear protected water. The depth in the anchorage varies from 6 to 18 fathoms, and the range of spring tides is 5 ft. A western extension, protected by another reef and known as Naingalóngalo, provides a hurricane anchorage for comparatively small craft. It has an area of about 100 acres and depths varying between 5 and 8 fathoms. The entrance channel from the main harbour is about 300 yd. wide with depths of 11-12 fathoms. Like the main harbour, this anchorage is protected by high hills on all sides except to seaward. Shallow streams drain into the bay. The principal one, the Lami river, is navigable for boats for about 3 miles. Two inlets near the wharf, Walu bay and Numbukulou creek, can be used by small boats.

Wharves. There are two wharves at Suva, the King's Wharf and the Public Works Department (P.W.D.) Wharf. The former is the only one available for ocean-going vessels. It is situated at the north end of the town and is built out from reclaimed land over the mud and sand which lie along the eastern side of the harbour. It has a length along the face of 1,400 ft., of which 900 ft. have a depth of 32-34 ft. alongside and the remainder depths varying from 25 to 32 ft. The north side, fronting the entrance to Walu bay, has a length of about 250 ft., and the south side about 450 ft., but there is little water alongside these and they are suitable for lighters and small craft only. Along the south side of the wharf is a floating



Fig. 61. Suva

Roads with pecked lines are projected or under construction. A, Department of Agriculture; B, Bank; C, Government Pharmacy; D, Town Hall; E, Engineering works; G, Old Government Buildings; H, Hospital; J, Colonial Secretary's residence; K, Burns, Philp building; L, Morris, Hedstrom building; M, Police station; P, Power station; S, School.

wooden staging known as the Princes' Landing, and used by small craft. The shore end of the wharf was originally made of an earth fill with timber piles on the seaward extension, the whole being covered with hardwood decking. Owing to sinking, the timber piles were replaced by concrete ones about 1930. The P.W.D. Wharf is situated on reclaimed land north of the entrance to Walu bay. It has a length of about 70 ft. and a depth of 16 ft. of water alongside.

Lifting Appliances. On the south side of King's Wharf is a wooden jib crane with a capacity of 2 tons and a radius of 30 ft. On the P.W.D. Wharf there are a travelling jib crane with a capacity of $3\frac{1}{2}$ tons and a radius of 60 ft., and a floating Priestman crane with a capacity of 60 tons.

Warehouses. In 1936 there were three large customs sheds on the King's Wharf, with a total floor space of 26,693 sq. ft., and at the northern end was a large open shed. The space between the two southernmost customs sheds has since been filled in with another shed providing about 2,000 sq. ft. of additional space. Behind the wharf are some copra sheds.

Other Facilities. There is a patent slip on the north side of the P.W.D. reclamation, with a length of 190 ft. and running on a 4-rail track 405 ft. long. The designed load for this slip is 500 tons dead weight, but on one occasion a vessel of 1,200 tons was successfully handled. A smaller slip with a length of 70 ft. for vessels up to 250 tons is also reported. Repairs to machinery can be undertaken by the P.W.D. shops near the slipway and at two other engineering works. These can all make iron and brass castings of moderate size. The P.W.D. shop has lathes, milling, screw-cutting, shearing and gulleting machines, a hydraulic press, oxyacetylene welding and electric drilling machines; it is also fully equipped for overhauling diesel engines, winding armatures and boat-building.

Oil depots maintain moderately large supplies of petrol, kerosine, fuel oil and lubricating oil. Coal is stored in a hulk moored in the north-east part of the harbour. Water for shipping is supplied at the King's Wharf from the Toorak reservoir.

The Town

The situation of the town is convenient, and a ridge with undulating slopes running southward to Suva point protects it from prevailing winds. The town proper extends southwards for about a mile from the King's Wharf, behind a wide sand and mud flat. (The Grand Pacific Hotel, on a stretch of reclaimed land, is near the

southern limit.) There are a number of churches, several hotels, the large modern commercial buildings of Morris, Hedstrom and Co. and Burns, Philp (South Sea) Company, two engineering works, many small business premises and Fijian and Indian markets. Along the road following the beach, Victoria Parade, are the Customs House, the G.P.O., fire station and cable office. Some of the larger buildings, notably the new government building, are of reinforced concrete construction.

Inland the residential district has spread about a mile over the low hills behind the harbour. The dwellings of the Europeans, mostly wooden bungalows, are widely scattered among gardens with abundant trees. The newer bungalows are on high ground at the back of the town or to the south of it, overlooking the harbour. The neighbourhood of Toorak road and Brewster street, the older residential part of the town, is more closely built over and settled mainly by Indians. European and Fijian settlements have also grown up at Lami, Suva point, Vatuwangga and near the reservoir at Tamavua, while there are Indian settlements at Muanivatu and Samambula. Roads linking these outlying settlements with Suva are in many cases tar-sealed; the others are gravel roads with a good surface.

The Suva power station, situated on the banks of the Numbukulaui creek, is equipped with four generators driven by diesel engines. Distribution was formerly by direct current, but conversion to alternating current is now almost complete. Water is supplied from three reservoirs. The main one, at Tamavua, 3 miles north of the town, has a capacity of 13,000,000 gal. (sufficient for 30 days' supply); of the two subsidiary reservoirs, one, near Tamavua, has a capacity of 1,500,000 gal. and the other, at Toorak near the hospital, holds 500,000 gal. Pumping machinery for the main reservoir is driven by a small oil engine.

In the total population of 15,522 in 1936 there were 1,863 Europeans, 3,471 Fijians, 933 mixed-bloods, 7,821 Indians and 1,034 Polynesians, Chinese and Melanesians. Rather more than half the population of greater Suva, made up mostly of Europeans and Fijians, were living in the urban area, while the remainder, including most of the Indian population, lived in settlements outside.

Trade

Exports and imports at Suva in 1939 amounted to £2,477,497, which represented 58 per cent. of the total trade of the colony. Of



Plate 24. Suva from the air

This view covers the central part of the area shown on Fig. 61. In the left foreground, on reclaimed land, is the Grand Pacific Hotel. Behind and to the right of it is the New Government Building. The southern end of the King's Wharf, with a ship berthed alongside, can be seen in the background.



Plate 25. King's Wharf, Suva

The south-west portion of the wharf only is shown. The square white building on the edge of the wharf is the Harbour Master's Office; the large white building on the left of the photograph is the Burns, Philp building.



Plate 26. Suva: small craft in Numbukulou creek

The native market is behind the buildings on the right of the photograph.

the remaining 42 per cent. almost all was through the port of Lautoka (*infra*). In some previous years the trade of the two ports has been approximately equal, and in 1935 Lautoka actually surpassed Suva; but the completion of the Circuminsular road and the establishment of the gold-mining industry have restored to Suva its supremacy.

In 1939 eight sailing vessels and 145 steam or motor vessels with a total tonnage of about 900,000 tons entered the port and nine sailing vessels and 140 steam or motor vessels cleared.

LAUTOKA (Fig. 62)

Lautoka (lat. $17^{\circ} 36' S$, long. $177^{\circ} 27' E$) lies on the west coast of Viti Levu, some 18 miles south-west of the mouth of the Mba river and 5 miles north-east of Nakorokoro lighthouse. Like the other main centres of European settlement in Fiji, with the exception of Suva and Levuka, Lautoka has been created by the sugar industry. The Colonial Sugar Refining Company established plantations in the district in 1900 and immediately following years and erected a large sugar mill. The government encouraged the enterprise by making Lautoka a port of entry in 1901.

In early years the growth of Lautoka was limited by lack of land communication. But in 1906 the company began the construction of a road and narrow-gauge railway linking all its mills and plantations on the north and west coasts. Cane is now carried by rail from Nandi and other centres some distance away to the Lautoka mill, which has a capacity of 62,000 tons in a normal season. Sugar from the Rarawai and Penang mills is also brought to the port for shipment overseas. Lautoka has thus become the most important sugar exporting port in the colony. In total trade it stands second to Suva. In 1939 exports and imports were valued at £1,717,558.

The Port

Lautoka harbour can be approached from both the north and the south. The entrance normally used is the northern one, lying between Mbekana and Vio islands. It is about 2,750 yd. wide between the fringing reefs of the two islands and has depths of from 6 to 11 fathoms. Small craft using the channel inside the barrier reef which skirts the north coast (Fig. 72) may also approach the harbour by the passage between Mbekana island and the mainland. The southern entrance is in open water until Vio island is neared. It then narrows rapidly from a width, between the 5-fathom lines, of about 900 ft.

opposite the south point of Vio island to one of about 400 ft. opposite the south-east point.

The harbour proper is limited to the narrow channel between the mainland and Vio island. The latter is a low islet, about $\frac{1}{3}$ mile in length, largely covered with mangroves and coconut palms. It is surrounded by a fringing reef. The shore of the mainland opposite is low, with mangroves, flats of mud and sand and a fringing reef. The channel itself at one point has barely 400 ft. between 3-fathom lines.

There is only one wharf, which is the property of the Colonial Sugar Refining Company; and only one ship can be berthed at a time. During the sugar exporting season this often causes inconvenience. The construction of a second wharf near Namoli village, about $1\frac{1}{2}$ miles to the north-east, has therefore been proposed.

The present wharf is at right angles to an embankment running out from the shore. The wharf is only 135 ft. long, but beyond each end of it there is a dolphin and a buoy to which the head and stern of vessels are secured. There are also two buoys near the opposite side of the channel for use when hauling off. The depth of water alongside is 21 ft. There is good anchorage to the north of the channel, at from 500 yd. from the wharf, in 6-7 fathoms, on a bottom of mud.

The Colonial Sugar Refining Company maintains a tug and two 50-ton lighters. In 1936 there were sheer-legs on the wharf, with a lifting power of about 6 tons. A railway track, connected with the company's main line, runs on to the wharf. No supplies of coal or fuel oil are maintained; and supplies of provisions are small. Water is available on the wharf. There are no engineering firms in the district apart from motor garages; but there is a depot of the Public Works Department. Lautoka has telephonic and telegraphic communication with other parts of Viti Levu; and there is a W/T station.

The Settlement

Lautoka, like the other sugar-milling centres of Fiji, is less a town than a number of separate settlements and groups of buildings surrounded by cane fields. Indians form the majority of the population. The mill itself, conspicuous from all points because of its high chimney, is situated about $\frac{1}{4}$ mile inland from the wharf, surrounded by stores and other buildings of the Colonial Sugar Refining Company (Fig. 64). Between it and the wharf are the customs house

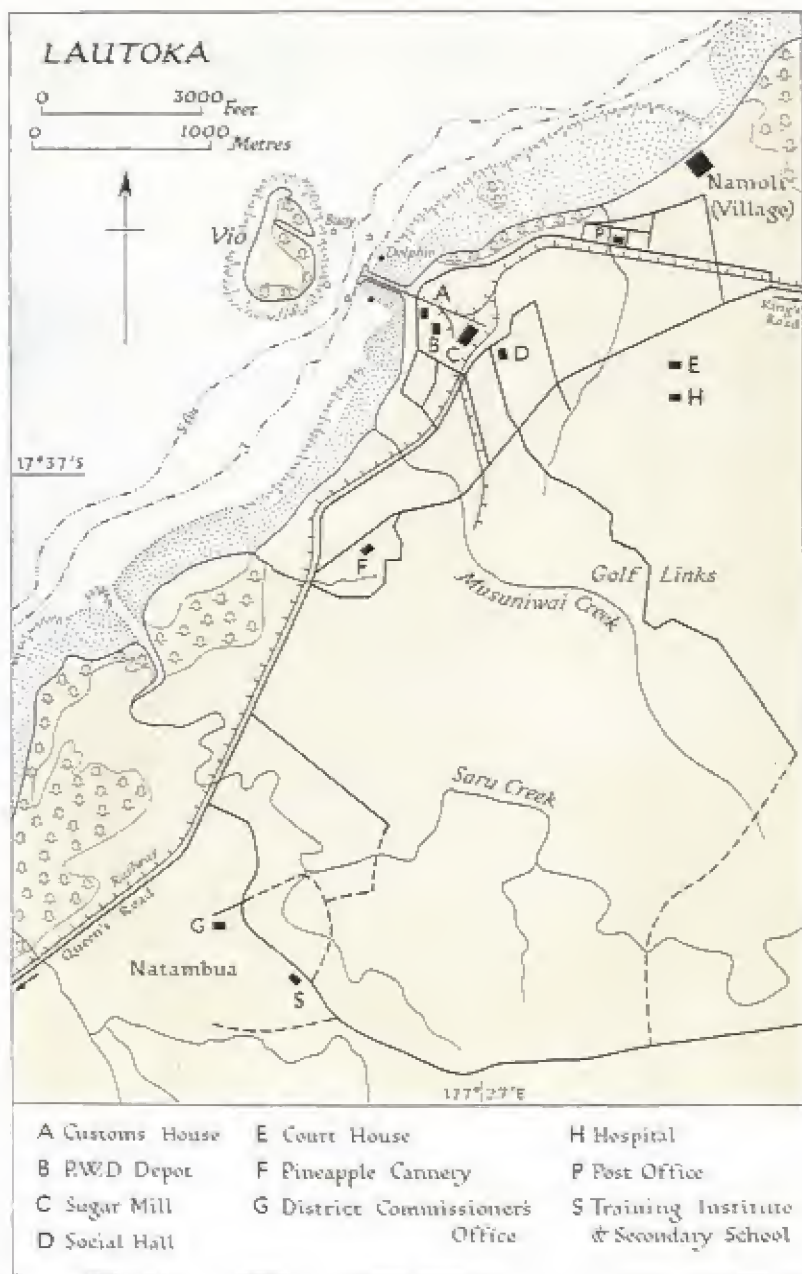


Fig. 62. Lautoka

Based on: (1) Admiralty chart no. 3576; (2) inset on Fiji Lands and Survey Department map of Viti Levu, 1939; (3) other official purposes.

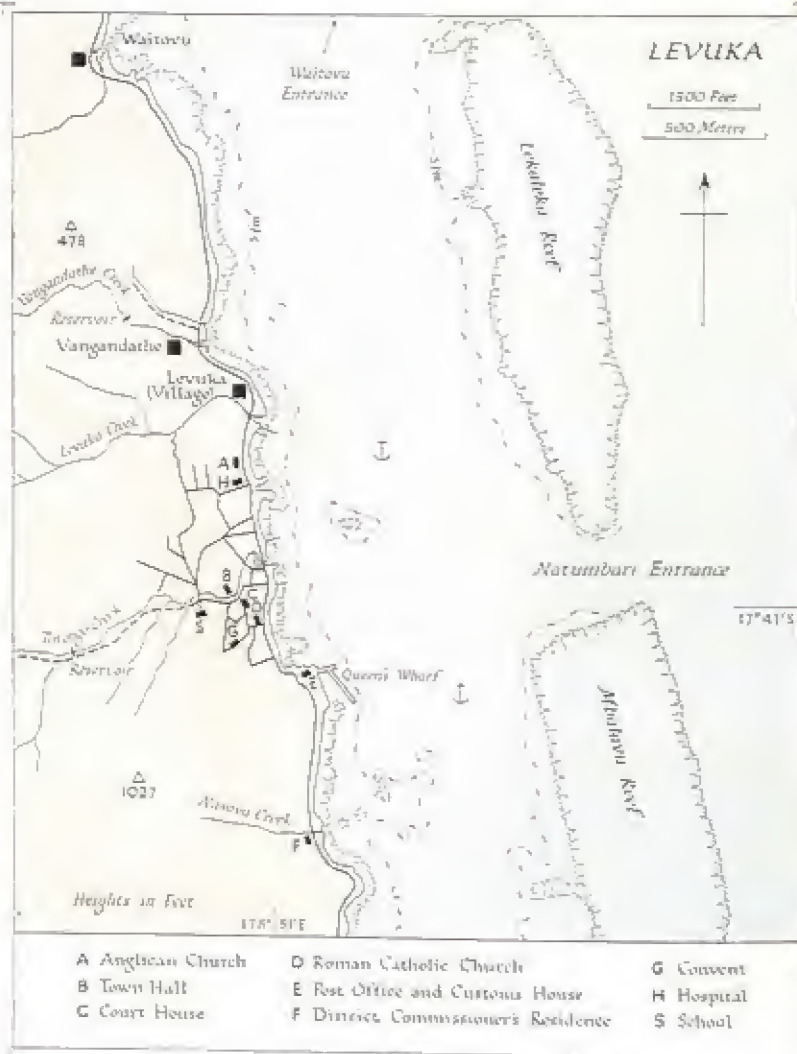


Fig. 63. Levuka

Based on: (1) Admiralty chart no. 1244; (2) inset on Fiji Lands and Survey Department map of Viti Levu, 1939.

and the public works depot. Behind it on a low hill are the company's offices and the residential quarters of its European employees. Further inland again are the government hospital and the court house. The commercial centre is about $\frac{3}{4}$ mile to the north-east. The main road runs parallel with the railway. Buildings include the post office, a hotel, two cinemas, the local branches of merchant firms, garages and the premises of small Indian storekeepers and tailors. Beyond this is Namoli village, the principal Fijian settlement. South of the mill settlement is more scattered. Two miles away is Natambua, the headquarters of the District Commissioner for the Western District. A Government Training Institution, for training Fijian and Indian teachers, was established here in 1929; there is an attached 'practising school' and also a government secondary school for Indians.



Fig. 64. Lautoka sugar mill

The ship is berthed at the wharf, and Vio island is seen behind it. Based on *The Colony of Fiji, 1874-1931*, plate facing p. 80 (Suva, 1931).

Recent improvements in road communications, the beginning of pineapple growing on a large scale and the increasing numbers and prosperity of the Indian population, make the position of Lautoka as the second settlement and port in the colony seem even more assured.

LEVUKA (Fig. 63)

Levuka (lat. $17^{\circ} 41' S$, long. $178^{\circ} 51' E$) is situated on the east coast of Ovalau. With Suva and Lautoka, it is one of the three ports of entry for the colony.

At one time Levuka was the principal port and European settlement in Fiji. It developed rapidly after 1860, when cotton growing brought settlers to the islands. By 1870 there were many thriving businesses there, and the harbour was continually busy with trading vessels from Australia and New Zealand, vessels engaged in the

native labour traffic, and schooners and cutters employed in the coastal trade. When a native Fijian government was formed, under Thakombau, in 1871, Levuka became its capital. It remained the headquarters of government after British annexation in 1874 (Plate 10). But it was already recognized that the supremacy of Levuka was unlikely to be permanent. There was too little flat land available for a growing town, and the harbour offered inadequate protection in easterly gales. Its situation on one of the smaller islands, which had been an advantage when hostilities between Fijians and Europeans were likely to break out, had become a drawback with the pacification and development of Viti Levu. The government moved to Suva in 1882, and business firms gradually followed it. In recent times Levuka has relied for such prosperity as it has enjoyed mainly upon the copra trade; but the depressed price of copra since 1931 has taken from it much even of this source of income. For many years Levuka has impressed by its unoccupied shops, its rusty iron roofs and the emptiness of its streets.

The Port

Levuka harbour lies behind two reefs, Mbalavu and Lekaleka, which are awash at low water. These lie roughly parallel with the shore and from 1,000 to 1,200 yd. distant from it. The passage into it normally used is Natumbari (or South) entrance, between these two reefs and roughly opposite the centre of the town. It is about 300 yd. wide between the 5-fathom lines and is usable by steamers either entering or leaving, under any conditions of weather and tide. Sailing vessels, if leaving the port in an easterly wind, frequently use the Waitovu (or North) entrance between Lekaleka and Mbulimbuli reefs. This is about 750 yd. wide between the 5-fathom lines. The depth is about 7 fathoms, but there are several coral patches in mid-channel.

Good protection from prevailing winds is afforded, but in very bad weather heavy seas pass over the reefs. Weather reports are posted up during the hurricane season, and signals given to shipping of the approach of atmospheric conditions possibly foreshadowing a hurricane. There are two anchorages. One is off the northern end of the town, in 16 fathoms, with a bottom of sand and mud. The other is nearly opposite the main wharf, in 10-15 fathoms, with a bottom of sand, mud and coral.

Wharves. At the south end of the town two wharves have been built on reclaimed land. One, extending north-eastward, is small



Plate 27. The main street, Levuka

The street follows the line of the shore. The buildings, on the landward side only, are typical of those in many Pacific islands settlements.



Plate 28. Wharves, Levuka

The large building is the Post Office and Customs House. Behind it, extending to the right-hand edge of the photograph, is the Queen's Wharf.



Plate 29. House-building at Somosomo, Taveuni

The covering of reeds is being applied to the wooden framework.



Plate 30. Suva harbour

A view looking west from near the hospital. In the foreground is Walu bay. On the low spit of land between it and the main waters of the harbour is situated the main depot of the Public Works Department.



Plate 31. The Singatoka bridge

A view looking south. The combination of short plate-girder spans with simple piers is used in a number of bridges in Fiji.

and unimportant. The other, known as the Queen's Wharf and stretching south-eastwards, is the main wharf (Plate 28). It is a little over 600 ft. in length. The landward end is old and of wooden construction; the seaward portion, 376 ft. long and 35 ft. wide, is newer and of concrete. There is a depth of 30 ft. alongside most of the wharf on the north-eastern side and 17 ft. on the south-western. Nearer the centre of the town there are several small wooden jetties which are used by small boats.

Port Facilities. The Queen's Wharf is lighted by electricity; and a supply of excellent water is available there. There are no lifting facilities, so that cargo has to be handled by ships' derricks. The post office and customs house are situated on the reclaimed land at the end of the wharf. Warehouse accommodation is available nearby, and the town has large sheds normally used for the storage of copra. No supplies of coal are maintained, but petrol is available in small quantities. There are no repair facilities.

The Town

The town of Levuka stretches northward along the narrow coastal flat for about $\frac{1}{2}$ mile from the Queen's Wharf and extends into the lower slopes of the steeply rising hills behind (Plate 27). To the north of this area are the native villages of Levuka and Waitovu; and to the south is Nasova, the site of Government House when Levuka was the capital and now of the residence of the District Commissioner for the Eastern District.

A road runs through the town and follows the coast north and south, linking Levuka with Nasova, Waitovu and settlements further out. Within the town other roads, or more properly lanes, branch out from it, forming a network which extends to the foot of the hills.

The population of Levuka has been declining for many years. In 1921 it was 1,479, but by 1936 it had fallen to 1,083, this latter figure including about 300 mixed-bloods, 250 Fijians, 160 Melanese, 150 Indians and under 100 Europeans.

Levuka is well provided with public utilities and civil amenities. There is an electricity supply, and water is obtained from small reservoirs on the Totongo and Vangandathe creeks. The town has a good public park and a town hall. There is a general hospital, under the control of a European medical officer. The Levuka school is the oldest in the colony providing education for Europeans. The missions maintain hostels for children attending it from a distance.

There are Roman Catholic and Methodist mission schools for Fijians and Indians outside the town.

Levuka is in telephonic communication with other parts of Ovalau and with Viti Levu. There is a W/T station.

LAMBASA

Lambasa (lat. $16^{\circ} 26' S$, long. $179^{\circ} 24' W$) is situated on the north coast of Vanua Levu. It is the principal settlement on the island. It became important when the Colonial Sugar Refining Company erected a mill there and established plantations in the surrounding country shortly after 1890. At the present time the cane fields cover 13,000 acres and spread over the low alluvial river flats along the coast for a distance of 35 miles. As in Viti Levu, light railway tracks have been laid to bring the cane into the mill. The Lambasa mill is the third largest in Fiji, ranking after Lautoka and Rarawai; its capacity in a normal season is about 20,000 tons.

The Anchorage

There is no port at Lambasa, but excellent anchorage is available inside the barrier reef. It is approached through Mali passage, which is wide and deep, with soundings in mid-channel of 20-44 fathoms, sides steep-to and no outstanding obstacles. The passage runs from north-west to south-east.

The anchorage lies between Mali island and the mud flats off the mouths of the Lambasa and Nggawa rivers, at a distance of 1,200 yd. from the shore. It is in 6 fathoms, on a bottom of soft mud. At Malau, just to the south-east of the anchorage, there is a boat pier. A firm of Chinese merchants maintains a store at this point, and a road runs from here to the settlement at Lambasa, about 7 miles inland. In 1936 three 50-ton lighters, two launches and a steam pinnace tug were maintained for the handling of cargo; there was also reported to be a 60-ton barge dredger.

Both the Lambasa and Nggawa rivers are navigable for some distance, the latter as far as Lambasa by vessels drawing up to 5 ft. At Lambasa there is a small patent slip.

The Settlement

Lambasa, like the other smaller settlements of Fiji, has not the form of a regular town. It constitutes merely the nucleus of an economic and social unit of which the cane-growing areas make up

the major part. Lambasa itself centres round the sugar mill. In its vicinity have grown up the offices and stores of the Colonial Sugar Refining Company and the houses of the company's employees. The headquarters of the District Commissioner for the Northern District are situated near by. As in the other milling centres, the majority of the population is Indian. The Indian settlement is officially known as the Township of Nasea.

OTHER SETTLEMENTS (Fig. 51)

In addition to the ports described above, there are in Fiji several other commercial or industrial centres of some importance. Like Lautoka and Lambasa, these are not regularly laid out towns but scattered settlements. Most are in Viti Levu and on the Circum-insular road (p. 227).

Amongst the oldest established are the sugar-milling centres of Nausori, Penang and Mba. Nausori, 12 miles north-east of Suva and 5 miles south of the government station at Nanduruloulou, lies on the left bank of the Rewa river, the most important navigable waterway in Fiji (p. 236). Since a sugar mill was built there in 1880, Nausori has been essentially a milling centre. It is surrounded by a network of railways bringing the cane to the mill. Several of the principal merchant firms have branches in the settlement; and there are many small stores and an Indian market. Nausori is connected by a bridge (Fig. 68) with Ndavuilevu, on the opposite bank of the river, where there is a hotel and an important group of schools controlled by the Methodist mission. Penang, in the north-east of Viti Levu, about 90 miles by road from Nausori, is a settlement of similar character but smaller size. The government station of Vaileka is situated there, and there is a hospital. From Penang there is a railway to the wharf at Ellington (p. 225), about 7 miles to the north-east. The settlement of Mba, in north-western Viti Levu, lies on both sides of the Mba river, which is crossed at this point by both road and railway bridges. Small steamers can navigate the river as far as the settlement. On the right bank is the Rarawai sugar mill, the second largest in Fiji. The government station of Namosau is on the left bank. There are several hospitals and schools, a number of stores and a hotel.

Nandi, 19 miles south of Lautoka (p. 215), and Singatoka, on the Singatoka river in the south-west of Viti Levu, though not milling centres, are in the middle of rich cane-growing areas. They are



Fig. 65.
Based on

market towns, primarily for Indian farmers, and have hospitals and schools; and in each case a government station has been established near by. Navua, on the Navua river, about two-thirds of the way from Singatoka to Suva, was formerly the site of a sugar mill; more recently a butter factory has been built there. The government station of Naitonitoni is about a mile distant from Navua settlement, on the sea coast.

Of much more recent growth are the gold-mining settlements at Vatukoula, in northern Viti Levu, and Yanawai, in the south of Vanua Levu. Production began at Vatukoula (Fig. 65) in 1935, and by the end of 1938 the settlement had a population of about 2,000. In addition to industrial and residential buildings, there are several schools, a number of stores and a cinema; and the mining companies have provided extensive facilities for physical recreation. Several miles from Vatukoula, on the Circuminsular road, is the older settlement of Tavua, with a government station and a number of Indian stores. Vatia wharf (p. 225), about midway between Tavua and Mba, provides the mines with sea communication. The settlement at Yanawai is very similar to that at Vatukoula, but on a smaller scale.

In a country so predominantly agricultural as Fiji, however, most of the people naturally reside outside these main settlements. Apart from Fijian villages (p. 150) and the stores and schools which to some extent serve as social centres for the Indian farming population, the most important focal points in rural areas are the government stations. One, in some respects of particular interest, is Nandavatu (Plate 12), in the mount Victoria region of Viti Levu, which was established about fifty years ago as a centre in which Europeans



Vatukoula in 1939
photographs.

could spend their holidays in a healthier climate than that of the coastal districts. In addition to official buildings, it still has a number of bungalows used for this purpose. In general, however, most government stations conform to a general pattern—with quarters for an administrative officer and his clerical staff and barracks for a detachment of police. In addition, schools have in many cases been built near by.

COMMUNICATIONS

Fiji, in some ways similar to the Hawaiian islands, is much less fully developed, and communications are as a result far less elaborate. Nearly all traffic with the outside world centres on Viti Levu; inter-island services similarly radiate from Suva. Land communications, in addition to the ubiquitous native tracks, consist of narrow-gauge railways on parts of Viti Levu and Vanua Levu and a limited network of vehicular roads (Figs. 66, 67).

Sea Communications

There are three ports of entry: Suva, Lautoka and Levuka. The great majority of overseas vessels call at Suva, even if they are visiting Lautoka or Levuka as well. Regular passenger services are maintained by the Canadian-Australasian and Matson lines. The former, which before the war held a mail contract from the governments of the three Dominions which it served and also received a grant of £5,000 from the government of Fiji, runs a monthly service between Vancouver, Honolulu, Suva, Auckland and Sydney. The time taken between Suva and Auckland is 3 days and between

Suva and Honolulu about 8 days. The Matson Line, American-owned, runs a service between San Francisco and Los Angeles, Honolulu, Pango Pango, Suva, Auckland, Sydney and Melbourne. The time taken between Suva and Pango Pango is 1 day. This service is assisted by the United States government. The Union



Fig. 66. Viti Levu and Vanua Levu: railways and regular local shipping services. Based on: (1) Fiji Lands and Survey Department map of Viti Levu, 1939; (2) map in *Fiji: Handbook of the Colony* (Suva, 1943); (3) G.S.G.S. map no. 4295 (Cassini's projection).

Steam Ship Company of New Zealand runs a cargo service between Australian and New Zealand ports and Vancouver, calling irregularly at Suva; the vessels used, of about 5,000 tons, also carry from 6 to 12 passengers. The Colonial Sugar Refining Company maintains three ships for the transport of sugar and molasses to Australia and New Zealand; these vessels carry sugar in bulk and

are also all equipped with tanks for the carriage of molasses. Other vessels calling occasionally at Fiji—principally at Suva—include liners on pleasure cruises, cargo steamers from United Kingdom ports, oil tankers and copra vessels. These last, after declaration at a port of entry, sometimes load at Ellington or Vatia, on Viti Levu, or at Lambasa, on Vanua Levu.

Local Sea and River Communications. Schooners and native canoes were for many years the only practicable means of communication between islands of the group and also with the inland districts of the larger islands. They have now largely been fitted with auxiliary engines or replaced by powered craft.

In 1939 there were 69 small craft of various kinds, totalling 2,216 tons, employed in trading within the colony. They included two new motor vessels of somewhat less than 500 tons, and ten small steamers besides launches and auxiliary sailing craft. The main services are controlled by Burns, Philp (South Sea) Company and Morris, Hedstrom, and receive subsidies. Copra, passengers, general merchandise and in some cases cattle are carried. The regular shipping routes link up Suva, Levuka and the coastal settlements of Vanua Levu and Taveuni (Fig. 66); occasional trips are also made to Rotuma.

Small steamers sometimes go also to Lautoka from Suva inside the reef, *via* the north coast. Before the opening of the Transinsular road this was the main means of communication between the two points. A route of some historical interest is that from Suva to Levuka, *via* the Lauthala and Navuloa mouths of the Rewa river. It is available only to small vessels and makes use of a canal which was cut by the people of Mbau in order to give passage to their canoes for an attack on the people of the Rewa delta.

There is barge traffic on the Singatoka and the Mba rivers, and the Navua and Nandi can be navigated by boats for about 5 miles. The Rewa, navigable by launches for about 60 miles, is still an important waterway; sugar is carried downstream from Nausori to Suva in barges towed by powerful tugs; bananas are brought down from higher upstream; and there is a launch service between Nausori and Vunindawa.

Railways

All the railways in Fiji are owned by the C.S.R. Co., and their primary function is to serve the sugar industry. Passengers are carried free. They are all light railways, with a gauge of 2 ft. There

are about 400 track miles of permanent way and about 160 miles of portable tracks; the rolling stock consists of about 50 locomotives (Plate 22) and 5,500 trucks. In nearly all cases the railways follow the coast, and in places they have been built across mangrove swamps (Figs. 62, 66, 71, 72).

On Viti Levu the principal stretch of railway extends east of Lautoka along the north coast to Tavua and south round the west coast to Singatoka. A short stretch also runs from Vunindongoloa along the north coast to the Penang mill and eastwards to Ellington wharf. A small network of lines has also been built on the low-lying land to the east of the Rewa river to feed the mill at Nausori. On Vanua Levu a series of lines runs out from Lambasa and Nasea for a short distance eastward along the coast; their route mileage is about 90 miles.

Roads

In Viti Levu the mountainous nature of the interior has restricted road construction. The longer rivers, by providing alternative means of communication and by making bridges necessary, have played their part in this retardation. Roads on the dry north-western side of the island were completed many years before those on the south and east. The road between Korovou and Matawailevu was completed only in 1933 and the road along the south coast in 1938.

Outside Viti Levu there are stretches of motor road on Ovalau, Vanua Levu and Taveuni. Everywhere else, inland communication depends on native tracks. These, forming a close network (Fig. 67), provide access to almost every part of the interior of the larger islands. Some can accommodate horse traffic, others can be used only by foot passengers.

The general surface of the roads is officially described as 'hard'. The normal method of road making, known as 'mulching', consists of placing a top dressing of gravel about 2 in. deep on a hard earth surface. Passing traffic rolls this gravel and provides a reasonably good surface. There is, however, a tendency to develop ruts, and this form of road does not stand up well to very wet weather; but it is easily repaired. Recent developments may have led to considerable improvement in surfaces in some areas. There are many timber bridges still in use, but these are being rapidly replaced by simple steel-girder bridges on concrete piers with a concrete carriageway, usually built to a standard design with spans of 30, 40 or 60 ft. Among the main river bridges are the Rewa bridge at Nausori, the

Singatoka bridge (Plate 31) and two bridges over the Mba, one for rail traffic and the other for road.

On Viti Levu, a road completely encircles the island, running near the coast on the north-west and south, but following the Rewa valley in the east. This road serves to link Suva with the various coastal settlements, sugar plantations and government stations. The



Fig. 67. Viti Levu and Vanua Levu: roads and tracks
Based on same sources as Fig. 66.

thickly settled area round Suva is better served with roads than elsewhere. There are two roads between Suva and the sugar-milling settlement at Nausori and local roads on the east bank of the Rewa are fairly plentiful.

Branch roads lead off the main road at various points. One from Nanduruloulou follows the Rewa river for about 7 miles. Another

from Korovou on the east coast continues northward to Londoni, which is the terminal point of the cable to Ovalau.

Of the two roads between Suva and Nausori, the Prince's road *via* Tamavua and Tholoisuva follows the high ground, while the other, near sea level, is liable to be muddy in wet weather. The Rewa bridge (Fig. 68), opened in 1937, takes all traffic going north from Suva. It consists of three 60-ft. approach spans and nine 12-ft. N-girder spans on cylindrical double columns joined by concrete ties. There is room for two lines of traffic, with footpaths on either side. From Nausori the main road runs north to Tavua. Parts are mountainous, especially the section which follows the Wainimbuka through a gorge about 100 ft. above the river bed.

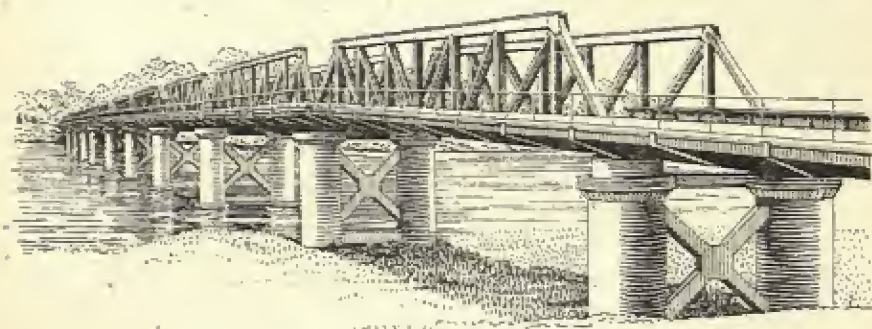


Fig. 68. The Rewa bridge, Viti Levu
Drawn from a photograph.

Along the north coast between Tavua and Lautoka, the road follows the coast through sugar plantations and is comparatively flat. The bridge over the Mba river is under water at times, but floods usually subside sufficiently within a few hours to allow the road to be re-opened for traffic. Between Lautoka and Singatoka the road is through flat land. The last section of the road to be opened—between Sovi bay and Navua in 1938—has some very hilly stretches and many hairpin bends.

On Vanua Levu a road joins Lambasa and Nasea with branches to Tambia, about 10 miles westward, and to Mbuileka and beyond Matailambasa on the east. The only road on the rest of the island is a short stretch running eastward from Vunisea.

On Ovalau and Taveuni there are coastal roads (Fig. 67).

Air Communications

Attempts to establish internal air services were made about 1932, when Fiji Airways operated two seaplanes with a government subsidy, to provide communication between Suva and Ellington and Suva and Singatoka. In 1935 the subsidy was withdrawn. The first and only overseas air service was inaugurated in September 1941, when Pan-American Airways made Suva a point of call *en route* from San Francisco to Auckland. A 200-ton float was moored in Lauthala bay to provide a landing stage and fueling facilities. Lauthala bay was selected in preference to Suva because the visibility is generally better and there are fewer obstructions to aircraft landing.

Before the war there were no regular airfields. Recently two of the ports have been equipped to handle seaplanes, and two airfields have been built on Viti Levu. Several long stretches of sandy beach on the south coast of Viti Levu would make suitable emergency landings for aircraft; and many of the lagoons behind the barrier reefs would provide protected landing places and anchorages.

Signal Communications

Suva is a station on the submarine cable between Vancouver and Auckland, being linked directly with Fanning island and Norfolk island.

Telephone communication is fairly well developed on Viti Levu and Ovalau, limited on Vanua Levu and Taveuni and lacking elsewhere. Ovalau is linked to Viti Levu by a submarine telephone cable from Londoni. On Viti Levu there are trunk lines from Suva to Nausori, Vunindawa and Londoni; and, by way of Navua, Nandi, Tavua, etc., to Nandarivatu. There are also short trunk lines on Vanua Levu and Taveuni.

W/T communication in the group is maintained by six government-owned stations. These are situated at Suva and Lautoka, on Viti Levu; Levuka, on Ovalau; Lambasa and Savusavu, on Vanua Levu; and on Taveuni. The smaller stations have a range of 250 miles; the station at Suva normally maintains contact with New Zealand. There is also a small station on Makongai island which communicates with Levuka.

There are 17 post offices in the colony. Mails are carried by motor lorry round Viti Levu, and by the subsidized inter-insular ships to Vanua Levu, Taveuni and Rotuma. Mails for outlying islands not

on the regular steamer routes are conveyed by schooners, cutters or launches. In some districts, notably the south coast of Taveuni, mail is still distributed by native carriers.

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For maps see Appendix I.

Chapter VI

INDIVIDUAL ISLANDS OF THE FIJI GROUP

Viti Levu: Vanua Levu: Kandavu: Taveuni: Lomaiviti Group: Yasawa Group: Lau Group

VITI LEVU

Viti Levu lies approximately between lat. $17^{\circ} 18'$ and $18^{\circ} 17'$ S and long. $177^{\circ} 15'$ and $178^{\circ} 43'$ E. With an area of 4,053 sq. miles, it comprises more than half the total land surface of the group and though less in size than New Caledonia and Hawaii, is one of the largest islands in the Pacific.

Relief (Fig. 69)

Viti Levu can be divided into four distinct types of country: (i) the high central Rairaimatuku plateau; (ii) the mountain ranges; (iii) large zones of hilly uplands, much dissected by rivers; and (iv) the coastal areas, consisting of low-lying plains near the coast and in the deltas of the principal rivers and of low rounded hills further inland.

The Rairaimatuku Plateau. This area, in the centre of the island, is about 50 sq. miles in extent and lies at a height of from 3,000 to 3,500 ft. above sea level. It is swampy and mainly covered with dense forest. To the east and west its sides drop sheer for about 2,000 ft. into the river valleys; to the north and south it merges into the mountains.

The Mountains. Running north and south respectively from the Rairaimatuku plateau, the Kuvandra and Tikituru ranges form the central backbone of the island. Near its southern end the former reaches a height of 4,431 ft. at mount Victoria (Tomaniivi), the highest peak in Fiji. From this point it trends north-eastwards to Ulunda (2,840 ft.), whence it follows the coast eastwards. The southern range reaches 3,708 ft. at Monavatu, in the centre of the island, 3,071 ft. at Tikituru and 3,060 ft. at mount Gordon (Tuvatau), some 10 miles from the coast.

At its north-eastern end the Kuvandra range merges into the North-east Coastal range, which follows the line of the coast southward as far as Tailevu point. The Tikituru range similarly joins the Lokalevu (or South Coastal) range. There are also mountain complexes in the west and south-east of the island less closely linked

with the central ranges. In the west the Naloto range bounds the Tholo West uplands and is joined by a high ridge to the Mount Evans (Thonoa) range, parallel to it but nearer the coast. The latter reaches a height of 3,921 ft. at mount Evans, about 10 miles inland from Lautoka. In the south-east the Korombasambasanga (Nambui) range runs north and south. It includes a number of high volcanic



Fig. 69. Viti Levu: relief

For general key to symbols see pp. 10-11. A, Mount Evans; B, Mount Victoria; C, Vatukalikal; D, Koromba; E, Malua; F, Mönavaru; G, Nambukelevu. 1, Rairai-matuku plateau; 2, Kouvandra range; 3, North-east coastal range; 4, Tikituru range; 5, Lokalevu range; 6, Naloto range; 7, Mount Evans range; 8, Nakasavu range; 9, Nambui range; 10, Namosi-Rewa range; 11, Nausori highlands; 12, Tholo East uplands; 13, Tholo West uplands; 14, Navua uplands. The ranges shown are generally above 2,000 ft. But the Lokalevu range (5), the ridge south of Koromba (D) and the greater part of the North-east Coastal range (3)—all of lesser altitude—are indicated to complete the major trends. Based on Fiji Lands and Survey Department map of Viti Levu, 1939.

peaks bounded by precipices falling several thousand feet. At Vuimasia it reaches 3,948 ft. To the east of it the Mendrausuthu range runs parallel to it, a wall of coarse volcanic rock, about 2,000 ft. high, which cuts across some of its ridges and spurs. From near the southern end of the Korombasambasanga range, and divided from the Mendrausuthu range by the Waindina river, another range

stretches eastwards roughly parallel with the coast. This is known as the Namosi-Rewa range. It includes the mountains seen across Suva harbour.

The Hilly Uplands. The areas between the mountain ranges consist of well-rounded hills, rising generally to between 1,000 and 2,000 ft., much cut up by the rivers passing through them. The largest of these regions (the Tholo East uplands) covers about 700 sq. miles in the north-east of the island. It is covered in its western part by rain forest; further east it is grass-covered, with forest only in the gullies. It is drained by tributaries of the Rewa. The Navua uplands, lying behind the South Coastal range and drained by the Navua river, are rather similar, though more difficult to penetrate. They cover roughly 300 sq. miles. To the west of the central ranges the Tholo West uplands cover between 500 and 600 sq. miles. Lying in the dry zone of the island they are known as *talasinga* (sunburnt lands), covered with grass and reeds and presenting to the eye an expanse of brown or greenish-yellow, broken only by occasional patches of green forest.

The Coastal Zones. The hilly regions inland from the coasts are generally similar in formation to the uplands, consisting of rounded hills and of steep-sided valleys, through which the rivers and streams make their way to the sea; but they are of much lower altitude. The land between the Tholo East uplands and the south-east coast, for example, is of this type. Inland near Nanduruloulou the hills are about 500 ft. high, but they decrease in height towards the coast. There are similar areas of considerable extent between Singatoka and Nandi and between Lautoka and the Mba river. In vegetation they also mark the transition between the uplands and the littoral zone proper. Inland they are covered by dense forest in the wet part of the island and by grass and reeds in the dry; towards the coast they merge into the cultivated area and are planted with sugar cane, rice and other crops.

The plains which fringe the coast are generally narrow except in the regions of the deltas of the principal rivers, where they broaden out. They contain the richest soils in the island and are densely populated and intensively cultivated.

The Rivers

The drainage pattern of Viti Levu is complex (Fig. 70). There are five major river systems—those of the Rewa, Navua, Singatoka, Nandi and Mba—and numerous coastal streams.

The largest, the Rewa, is formed of four main streams—the Wainimbuka, Wainimala, Waindina and Waimanu—besides a multitude of minor tributaries. It drains a third of the island. The Wainimbuka and Wainimala start as mountain torrents on the south flank of the Kauvandra range and join in the broad plain around Vunindawa. The combined stream, known from this point as the Rewa, flows for some miles through a deep gorge between soapstone hills, and many tributaries enter it in the form of falls or cascades.



Fig. 70. Viti Levu: drainage

Tributaries of the Rewa are indicated as follows: 1, Wainimbuka; 2, Lawaki; 3, Wainimala; 4, Waindina; 5, Waimanu. Based on same source as Fig. 69.

Below Viria it broadens and receives its two other main tributaries, the Waindina and Waimanu, from the west. In its lower reaches the channel of the Rewa is broad and deep, but in places obstructed with sandbanks. The banks of the river are higher than the plains behind, and there is occasional flooding. It enters the sea through an extensive delta. There are three main mouths. The river is navigable by small steamboats for about 60 miles (Plate 32). In the lower reaches there is considerable barge traffic between the sugar mill at Nausori and the mouth.

The Navua river rises in the vicinity of mount Gordon and drains the forested uplands between the Tikituru and Lokalevu ranges. Its most important tributary, the Wainikoroiluva, has its source further to the north-east in the Korombasambasanga range, and within a short distance of many streams draining into the Rewa system. In its lower reaches the river flows through a deep canyon with vegetation-clad walls rising up to 300 ft. It enters the sea through two mouths, on either side of Ndeumba island. It is navigable for boats for about 5 miles (Plate 33).

The Singatoka river rises near Nandarivatu, in the north-west of the island, and flows in a generally south-westerly direction towards the sea. It drains the extensive *talasinga* lands of Tholo West. About 15 miles from the sea it enters a fertile flood plain, through which it flows between raised banks. It enters the sea over a sand-bar, on which the waves break. It is navigable for small boats over a considerable distance.

The Nandi river, which with its tributaries drains the lands between the Nausori highlands and the sea, is the smallest of the major river systems. The main river is navigable by boats for some distance.

The Mba river rises near the Singatoka and flows parallel to it for some distance; it then turns north and reaches the sea in the north-west of the island. Since it drains the driest part of the island it often carries little water, but it is liable to flood. It enters the sea by three mouths which cross an extensive mangrove-covered delta. The river is navigable for small steamers as far as Mba settlement, where the Rarawai sugar mill is situated.

Coasts

The coast of Viti Levu is surrounded by an extensive reef system (Figs. 34, 71, 72). For the most part it forms a barrier reef linked by patches of detached coral to the reef systems of neighbouring islands. The islands of Ovalau and Moturiki are actually within the Viti Levu reef. Over large stretches of coast the waters between reef and shore are deep and navigable, though requiring careful navigation because of the presence of coral patches. There are numerous small stretches of fringing reef, short beaches and many mangrove swamps. Behind the shoreline the land is for the most part low and rolling. Communication is provided by a coastal road and railway (Figs. 66, 67). There are few European settlements but many native villages.

The South-west and South Coasts. From Uverite point, the most

westerly point in the island, to Natandola, a distance of about 10 miles, the coast is protected by a barrier reef. There is a small boat passage within the reef and a pass opposite Likuri harbour. Eastward of Natandola to within 2 miles of the mouth of the Singatoka river there is only a fringing reef, and at the latter point this gives place to sand dunes. To the east of the Singatoka the reef is again fringing as far as Serua harbour, 11 miles west of Navua, where a barrier reef begins again. Over this stretch there are occasional bays, with passes through the fringing reef and small beaches at their heads. Between Viti Levu and Mbengga island, off the mouth of the Navua river, there is a deep-water channel clear of coral patches. Immediately to the west of the Navua river is Rovondrau bay, protected from the prevailing wind and with an extensive sandy beach. Between Rovondrau and Suva harbour (p. 212) there are both fringing and barrier reefs, the latter being about 3 miles from the coast.

The South-east and East Coasts. East of Suva, barrier reefs continue and extending north-eastwards enclose the islands of Ovalau and Moturiki. The outer patches of reef are in places as much as 2 miles wide and are awash at low water.

In Lauthala bay and again north of Kamba point the waters within the reef are navigable, though in many places studded with detached coral. In the region of the Rewa delta, however, between the Nukulau and Navuloa mouths, the reef is backed by mud flats, which are only passable by boats at half tide. The shores of the delta are fringed with mangroves, and these extend northward for a further 8 miles beyond the Navuloa mouth. The hinterland remains flat and featureless as far as Tailevu point.

North of Tailevu point conditions change. Small reefs extend north-eastwards to join the reef system of Vanua Levu, leaving the Vatu i Ra channel, about 3 miles wide, as the only unobstructed deep-water passage between the two islands. The shoreline between Tailevu point and Viti Levu bay, about 23 miles, is also markedly different, with a fringing reef, and an alternation of bluffs and of small bays with sandy beaches. Viti Levu bay is a major indentation in the coast, about 4 miles wide at its head and 5 miles deep. The waters of the Rukuruku river drain into it. Its shores are a succession of stony beaches, patches of mangrove swamp and bluffs.

The North Coast. The whole of the north coast, from Viti Levu bay to the mouth of the Mba river, is protected by a well-developed barrier reef system. There are a number of passes, and the waters inside the reef are much used for navigation. In the channel are a

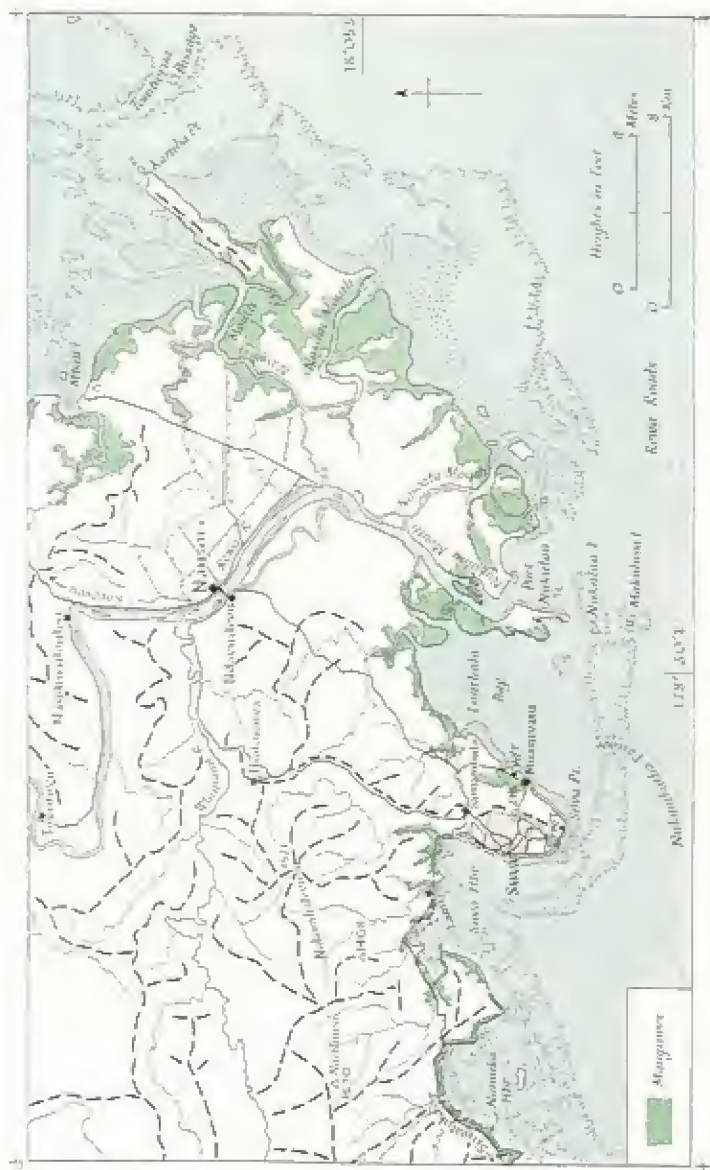


Fig. 71. Viti Levu-Reva coast

The road shown between Samabula and Tholouva follows the top of the ridge, but for clarity has been indicated beside it. For general key to symbols see pp. 10-11. Based on: (1) Admiralty charts nos. 995, 1660, 1757; (2) C.S.C. 8, maps nos. 4296, 4297; (3) Fiji Lands and Survey Department map of Viti Levu, 1939.

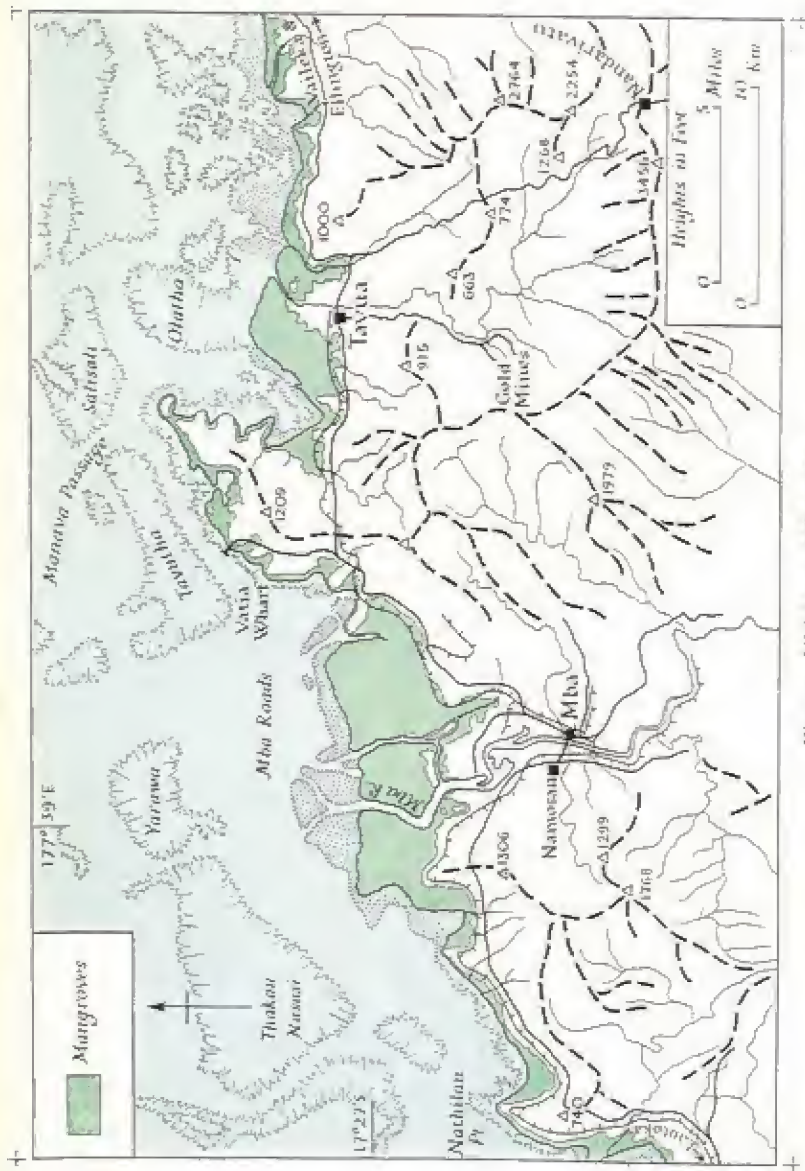


Fig. 72. Viti Levu: Mba coast

For general key to symbols see pp. 10-11. Based on: (1) Admiralty charts, nos. 379, 845; (2) C.S.C.S. map no. 4296; (3) Fiji Lands and Survey Department map of Viti Levu, 1939.

number of off-lying islands—in the extreme north-east, Nananu i Ra and Nananu i Thake; Malake, 5 miles further west, rising to 722 ft. and fringed with mangroves on its northern side; Tovu and Mathuata; and Vatia Lailai, off Vatia point. The northern shore of Viti Levu is irregular, with occasional headlands where spurs from the ranges reach the coast, a few beaches, patches of detached or fringing coral, mudbanks and extensive mangrove swamps (Fig. 73).

The West Coast. Beyond the Mba river, south-westwards to Nandi bay, the off-lying reefs are more scattered. As far as Nakorokoro point the shore is characterized by fringing reefs, mudbanks and mangroves. About 4 miles north of Nakorokoro is the settlement of Lautoka (p. 215). South of Nakorokoro (which is marked by a light-



Fig. 73. Malake island and Navuvua (about 1876)

Looking northwards from near Vaileka, on the north coast of Viti Levu. The mangrove swamps, inundated at high tide, are still typical of much of the north coast of the island: Based on a watercolour drawing by Miss C. F. Gordon Cumming.

house) is Nandi bay, about 5 miles across and between 3 and 4 miles deep. Its shore is flat, with sandy beaches and off-lying mudbanks. The coast further south, as far as Uverite point, is similar in character to that immediately to the northward of Nakorokoro. Near Uverite point the Malolo reef approaches the Viti Levu coast.

Anchorage

Viti Levu has many fine anchorages (Fig. 69), among which Suva harbour (Plate 30) is best known and probably the finest. They are nearly all in deep and well-protected waters behind the barrier reefs. Only in the west of the island is it necessary to make use of open roadsteads.

The South-west and South Coasts. In the south-west is Likuri

harbour, small and difficult of access for sailing vessels but well sheltered in all weathers. Entry is through a pass in the barrier reef. Anchorage is in 3 fathoms on a mud bottom. Natandola harbour, $3\frac{1}{2}$ miles south-east, provides a poor anchorage in 4 to 5 fathoms close to Nuro (Songo) island; it is subject to a heavy swell. Similarly subject to swell and also open to the south is Thuvu harbour, $6\frac{1}{2}$ miles further east. Entrance is through a break in the reef 450 yd. wide. Anchorage is in 5 fathoms on a sandy bottom. On the east side of the bay there is a large boat harbour, between Yanutha island and the shore.

In the 40 miles of coast eastward of Thuvu there are only three small exposed anchorages, at Sovi, Korolevu and Vunaniu. Serua (Yarawa) harbour is then reached. It is larger and is well protected by the Serua reef from all quarters. The best anchorage is 1,200 yd. eastwards of Serua islet, in 16 fathoms on a mud bottom. Rovondrau bay, 10 miles further east, has a large expanse of comparatively shallow and partly protected water possessing some possibilities as an anchorage. Immediately beyond Rovondrau there is good shelter for small vessels in the Navua roads, between the two mouths of the Navua river. Anchorage is in 4 fathoms on a mud bottom. At Naitonitoni, $2\frac{1}{2}$ miles north-east of Navua, good anchorage is obtainable in about 6 fathoms, protected by the reef. The best anchorage is reached through Tangoro passage. There is a small pier opposite the village.

Eastward of Naitonitoni there is probably anchorage for small craft at Nanggara and Veivatuloa. The most important anchorage area in the whole island is then reached, with ample accommodation for large ships. Namuka harbour, $1\frac{1}{2}$ miles from Veivatuloa, is reached through the Namuka passage, over a mile long and rather over $\frac{1}{2}$ mile wide, with deep water in the channel. Anchorage is in 16 fathoms and is well protected by high ground on the east and by reefs to seaward. Eastward of Namuka is Suva harbour (p. 212). About 2 miles beyond Suva is Lauthala harbour, an area of about 4 sq. miles, protected by high land to the west and north, by the mud flats and mangrove swamps of the Rewa delta to the east, and by reefs to seaward. Entry is either through the Nukumbuthu passage, with a width of 150 yd. between 5-fathom lines, or by a shallow channel inside the reef from Suva harbour. Anchorage is in depths varying from 5 to 14 fathoms on a muddy bottom. The eastern part of the harbour is known as Port Nukulau, because cargoes brought down the Rewa river in barges were frequently transhipped there. Between the Nukulau

and Nasoata mouths of the Rewa is the anchorage known as the Rewa roads. It is slightly protected from the east by the Nasilai reef, but in strong winds this protection is inadequate. Muddy water from the river also makes it dangerous by obscuring obstacles.

The East Coast. In the extreme south-east of the island anchorage can be obtained in a small bay at the Nasilai mouth of the Rewa, in 8 fathoms on a sandy bottom, with good protection from all winds. But between here and Tailevu point, over 30 miles to the north, there are no known good anchorages. The extensive Mbau waters, within the barrier reef, are much obstructed by coral and by mudbanks. There is fair anchorage in the lee of Nggoma Levu island, off Tailevu point, in 7 fathoms, and on the west side of Tanavuso point, 10 miles further north. Between here and Viti Levu bay, some 14 miles to the northward, all the bays provide good anchorage on a muddy bottom. Viti Levu bay (p. 238), with a depth of about 12 fathoms, should provide a possible anchorage, though it has been little used as such in recent years.

The North Coast. Anchorages on the north coast, between Volivoli point and the Mba river, are nearly all inside the barrier reef, and approach to them is difficult. In the north-east there is good holding ground between the island of Nananu i Thake and Yanutha islet on blue mud, with depths of 13-16 fathoms. The anchorage is well protected by the reef joining the islands. Six miles to the west, anchorage is obtainable to the south-west of Malake island, in 12 fathoms. To the westward of Mathuata island there is very good anchorage—for small craft in a bight in the reef joining the island to the mainland, and for larger vessels slightly further west, in 9 fathoms. Off the mouth of the Mba river, anchorage is available on a mud bottom in any convenient depth in the Mba roads.

The West Coast. About 18 miles south-west of Mba is the port of Lautoka (p. 215). The only other anchorage on the west coast north of Uverite point is in Nandi bay, which is open to the west but partly protected by off-lying islands. The depth of water decreases from 11 fathoms to $2\frac{1}{2}$ fathoms near the shore; holding ground is good anywhere in the bay. The best anchorage is to the south-east of Iakuilau islet in 4 fathoms.

Social and Economic Conditions

At the time of the 1936 census Viti Levu had a population of 132,191, or over two-thirds of the total population of the group. Suva (p. 211) is both the political and commercial centre of the

colony, and all important industries are carried on in the island. The general review of social and economic conditions in Fiji given in Chapters IV and V thus adequately covers conditions in Viti Levu.

ISLANDS OFF VITI LEVU

Scattered round the coast of Viti Levu are several islands which are here described in sequence from the Mamanutha group, in the west, to those off the southern coast. The numerous small islands on the east and north coasts often forming portions of river deltas have already been mentioned (pp. 238-9).

MAMANUTHA GROUP

Some 20 miles to the south of Waya in the Yasawa group and to the east of the Mamanutha reefs lies a scattered group of small islets, each a square mile or less in area. The largest are, from north to south, Vomo, Tokoriki, Yanuya, Tavua and Mana. Vomo, Yanuya and Tavua are inhabited.

MALOLO

Malolo (lat. $17^{\circ} 45' S$, long. $177^{\circ} 11' E$) is a roughly circular island about 2 miles in diameter and with an area of about 4 sq. miles. It has a central peak about 750 ft. high. The population is 239. The shore is surrounded with reef, and a mile to the north-west is the islet of Ngualito, while a similar distance to the south-east lies the rhomboidal islet of Malolo Lailai with a population of 19 in 1936.

VATU LELE

Vatu Lele (lat. $18^{\circ} 30' S$, long. $177^{\circ} 40' E$), a long lanceolate island, lies 36 miles north-west of Cape Washington in Kandavu and nearly 20 miles to the southward of the mouth of the Singatoka, on Viti Levu. Its greatest length from north to south is about 6 miles and its greatest breadth nearly 3 miles. It is a mass of elevated limestone with flat top that dips gently from west to east and supports palms, casuarina, pandanus and dense brushwood. Coral reef fringes the west shore and forms a barrier off the east coast. The enclosed lagoon is shallow and unsafe at low water for vessels-drawing over 10 ft. The west coast is precipitous with cliffs up to 100 ft. high (Plate 13) and occasional sandy beaches; the east coast is low and flat. The four villages, all on the east coast, contained a population of 395 in 1936. Small quantities of sweet potatoes and yams are available but there is no good water.

MBENGGA AND YANUTHA

Mbengga (lat. $18^{\circ} 22' S$, long. $178^{\circ} 08' E$) is a roughly circular island of volcanic origin, lying about 6 miles south of the mouth of the Navua river on the south coast of Viti Levu. Its diameter is about 4 miles and its area 14 sq. miles. A massive barrier reef encircles it and the much smaller island of Yanutha, about 6 miles to the west. To the south-east, south and south-west the reef is unbroken, but on the north-east and north-west is reduced to a few isolated patches with several deep and wide passages between. On the north there is a

break of several miles. The interior of Mbengga is mountainous with a centrally placed hill 1,400 ft. high and a ridge containing several other high peaks which runs from this to the south-west coast. The coastline is broken by three large bays: Kavanga on the west coast; a bay on the south-east (Plate 15) with the islet of Moturiki off it; and Malumu bay on the north-east. Sandy beaches fringe the western shores, while there are precipitous cliffs of conglomerate on the east (Fig. 74). Fringing reefs occur everywhere except in Kavanga bay. The whole



Fig. 74. Cliffs on the east side of Mbengga

These cliffs are composed of a volcanic conglomerate breccia. Based on A. Agassiz, 'The Islands and Coral Reefs of Fiji', *Bulletin of the Museum of Comparative Zoölogy at Harvard College*, vol. XXXIII, plate 46 (Cambridge, Mass., 1899).

island is densely covered with vegetation. The eight villages on the coast contained a population of 590 in 1936.

Yanutha island, roughly circular in outline, is about $1\frac{1}{4}$ miles long and nearly a mile wide. It contains two peaks, one 450 and the other 380 ft. high.

A few other small islets and many coral heads occur in the Mbengga lagoon. Depths inside the lagoon are mostly from 10 to 20 fathoms. Frigate passage on its western side can be used by vessels of any size, while Cutter passage, due east of Mbengga, is narrow and difficult for sailing vessels.

VANUA LEVU

Vanua Levu (Figs. 75, 76), the second largest island in the archipelago, lies approximately between lat. $16^{\circ} 08'$ and $17^{\circ} 01'$ S and long. $178^{\circ} 30'$ E and $179^{\circ} 55'$ W. Of irregular form, its greatest length is 114 miles, its average breadth 18 to 20 miles, and its area 2,137 sq. miles.

Relief

The mountains of the island may be divided into three groups: (i) the main backbone of the island; (ii) the hills along the north



Fig. 75. Vanua Levu: relief

Contours are only approximate. Based on: (1) H. B. Guppy, *Observations of a Naturalist in the Pacific between 1896 and 1899*, vol. I, map facing p. 1 (London, 1903); (2) G.S.G.S. map no. 4293 (Cassini's projection).

coast; and (iii) mountains of the Natewa peninsula. The main range begins in a chain of low hills in the Seatovo peninsula, at the south-western end of the island, and trends north-east forming successively the Natewa plateau, the Wainunu tableland and the Korotini tableland, with many high peaks including Ndelaikoro (3,085 ft.), Nasorolevu (3,386 ft.) and mount Thurston (3,139 ft.). The mountains in the Natewa peninsula consist of three main groups—in the west, south-east and north-east—culminating in mount Ngāla, a peak 2,740 ft. in height.

The plains of Vanua Levu are lower, flatter and drier than those

of Viti Levu. Those between the main range and the north coast are much larger than the plains to the south of the mountains. They consist of level lava flows overlaid by 'soapstones' and are covered with grass, ferns and reeds with occasional clumps of trees. The plains to the south of the main ranges are no more than discontinuous areas averaging 2 or 3 miles wide. Rivers flowing from the southern slopes of the main range to the sea are short, straight and very swift-flowing. The northern rivers have more ramifications and pursue sinuous courses to the sea. All the larger rivers have swampy



Fig. 76. Vanua Levu: drainage and hot springs; settlements

All the villages marked had 100 or more inhabitants in 1936 (except Mbua and Nambouwalu, which are included for their historical and administrative significance). Based on: (1) G.S.G.S. map no. 4295 (Cassini's projection) for coastline and drainage pattern; (2) H. B. Guppy, *Observations of a Naturalist in the Pacific between 1896 and 1899*, vol. 1, map facing p. 1 (London, 1903); (3) *A Report on the Fiji Census, 1936* (Suva, 1936).

deltas covered with mangroves. From west to east, the main northern rivers are the Lekutu, Sarawangga, Ndreketi, Wailevu, Lambasa, Nggawa, Mbuthaisau, Wainikoro and Nasavu. The Lambasa and Nggawa are joined by a cross stream inland of the mangrove area at their mouths. The mouths of the Lekutu, Sarawangga and Ndreketi are ports of call for the inter-island steamers. The Ndreketi is navigable for 18 miles; the Nggawa, on which are situated the government station and sugar centre of Lambasa, is navigable by boats for 10 miles from its mouth.

Coasts

Fringing coral reefs are present everywhere except along a stretch of the north coast from the Lekutu to the Ndreketi rivers and locally at the mouths of most rivers. Along the north coast there is in addition a series of off-lying reefs, the outermost being the Great Sea reef which extends in a long arc from Round island passage in the Yasawa group. Among major openings through it are the Mali pass opposite the Lambasa, the Sausau pass opposite the Wainikoro and the Tilingitha opposite the Nasavu. The reefs intermediate between this and the coast are isolated patches and stretches of varying size.

The south coast has no such massive reef. There is a slender and discontinuous barrier off the south-west corner of the island and extending in a large loop almost as far as the island of Makongai. A narrow loop projecting from its eastern extremity off Nasonisoni point is known as the Namena barrier reef. A reef of similar type off the east coast of the Natewa peninsula encloses the islands of Rambi and Kioa. Large isolated patches of reef occur in Mbua bay and to the east of Nasonisoni point.

The west end of the island is formed by mount Seseleka, to the north of which is Rukuruku bay, protected on the north by a promontory containing the peak Uluinasiva. Wailea bay cuts into the eastern shore of the promontory. Thence the coast trends generally north-eastwards for about 25 miles as far as Raviravi point. It here forms the seaward edge of the Lekutu-Ndreketi plains and is low-lying, fringed with sandbanks and mangroves. With the exception of the long narrow estuary of the Sarawangga, no large indentations occur. About 5 miles off the coast in this section, in a tangle of reef, lie the islands of Yanggangā, Ngaloa and Tavea Ndongu. The last two are on completely closed circuits of reef.

Raviravi point is the western end of the Nawavi range that for about 20 miles follows the coast a mile or so inland. It affects local weather conditions, giving rise to squalls that have taken heavy toll of the local sailing craft. This section of the coast as far as and beyond the mouth of the Lambasa has no indentations. Extensive mud flats occur at the delta of the Lambasa and Nggawa rivers. The rest of the north coast as far as Undu point is a succession of narrow promontories separated by small bays. A chain of small islands lies a mile or two offshore, the largest being Mali, a narrow island about 4 miles long.

From Undu point south-westwards as far as the head of Natewa bay, a distance of about 50 miles, the coast is almost straight and devoid of major indentations. At the head of Natewa bay is the narrow isthmus, a few hundred yards wide, by which the Natewa peninsula is attached to the main mass of Vanua Levu; it is low enough for canoes to be dragged across. The north-west coast of the Natewa peninsula is similarly straight and featureless, but the east coast is more indented with Mbutha bay, approximately midway, about 3 miles across. The southern coast as far as the isthmus has numerous slight indentations. The southern side of the isthmus contains a salt lagoon, almost land-locked.

From this lagoon as far as Naithombothombo point are three large bights, Savusavu bay, Wainunu bay and Mbua bay, separated by massive promontories.

Anchorage

There are abundant anchorages, but only one, Lambasa, has any port facilities. Those on the north are in general well sheltered from prevailing winds, but at river mouths with depths on the bars so shallow that only boats can proceed up the rivers. Those on the south coast are wide bays, each containing several areas suitable for anchorage.

Rukuruku bay at the western end of the north coast faces west and gains shelter from the two large patches of reef, Laukoto and Laukoto Lailai, separated by a channel 10 fathoms deep. Large areas within the bay have depths of 7-13 fathoms. The bottom is mud with good holding ground, providing a safe anchorage in the hurricane season. Wailea bay, a few miles to the east of Rukuruku bay, is a narrow and much smaller bay with its entrance protected by Yangganga island and several patches of reef. There is good anchorage in 4 fathoms on sand.

The Lambasa and Nggawa rivers, with depths of 3 ft. on the bars, have staked channels through the mudflats at their mouths. Both have already been described more fully (p. 220).

Timbithi harbour (lat. $16^{\circ} 13' S$, long. $179^{\circ} 46' E$) is entered by a narrow channel through the mudflats and has anchorage in 5 fathoms on mud. Yasawa harbour on the south side of the Undu peninsula has anchorage in 12-15 fathoms on a very uneven bottom. Mbutha bay on the east coast of the Natewa peninsula has excellent holding ground and provides good shelter in hurricanes to vessels with local knowledge.

Social and Economic Conditions

The population of Vanua Levu in 1936 was 32,086. It included 15,755 Fijians, 14,431 Indians, 1,079 mixed-bloods and 334 Europeans. Distribution of the first two groups can be seen in Figs. 44 and 45. The mixed-bloods are mostly small copra producers, many of whom live round the coast of Savusavu bay, while the Europeans are mainly concentrated in Lambasa, Yanawai and Valethi.

The main agricultural activities are sugar growing in the plains round Lambasa, rice growing by the Indians in the same areas and copra manufacture along the coasts. Gold mining at Mount Kasi, near the mouth of the Yanawai, is carried on by Mount Kasi Mines, Ltd. The Mbua district, in the west, was formerly the centre of the sandalwood trade. Though the supply of this timber is now nearly exhausted, other types of trees are felled in many areas in the western half of the island.

ISLANDS OFF VANUA LEVU

Off the coast of Vanua Levu there are a number of small islands. The most important are Yandua, Yangganga, Thikombia, Rambi and Kioa.

Yandua (lat. $16^{\circ} 49' S$, long. $178^{\circ} 19' E$), lying 9 miles to the west of Naithombombo point, has an area of about 5 sq. miles. It is a heavily eroded volcanic cone (641 ft. high) with spurs descending to form narrow promontories on all sides. The intervening bays are long and narrow. Fringing reef surrounds the whole coast. Strachan harbour on the west coast is suitable only for small vessels, anchorage being restricted by coral patches. In 1936 the population was 64.

Yangganga, about 2 miles to the north of the north-west extremity of Vanua Levu, is a rocky, barren island with several sharp peaks the highest of which attains 887 ft. The population was 49 in 1936.

Thikombia (lat. $15^{\circ} 43' S$, long. $179^{\circ} 55' W$), the northernmost island of Fiji, is $6\frac{1}{2}$ miles long and averages about 1 mile wide. It is wooded and has a narrow ridge running along its length. The population (143 in 1936) is very isolated, being supplied with stores at long intervals by a visiting cutter.

Rambi and Kioa both lie off the eastern coast of the Natewa peninsula within a narrow and much interrupted barrier reef which forms a large loop to the north-east of Rambi. The former, the larger of the two islands, lies about 5 miles east of Kumbulau point. With an area of 27 sq. miles, it is roughly triangular in shape with a greatest length of 9 miles and a greatest width of $4\frac{1}{2}$ miles. A central mountain peak 1,550 ft. high is buttressed by ranges of hills extending to the north-east, west and south-east. The coast has several deep indentations providing good anchorage for small vessels on its east and south sides but is almost completely fringed with coral. The island, which is densely wooded and well watered, is privately owned and worked as a copra plantation. In 1936 the 251 inhabitants composed the labour force.

Kioa, with its southern tip $\frac{1}{2}$ mile from the shore of Vanua Levu, is situated in Mbutha bay. It is of irregular coastline, with a large bay on the west coast. It is uninhabited.

About 15 miles to the east of Rambi lie the small islets of Thombia, Yavu, Yanutha and Manggewa, enclosed in a large barrier reef.

KANDAVU

Kandavu (Fig. 77), the third largest island of the archipelago, lies approximately between lat. $18^{\circ} 36'$ and $19^{\circ} 10' S$ and long. $177^{\circ} 57'$ and $178^{\circ} 30' E$, about 50 miles south of Viti Levu, from which it is separated by the Kandavu passage. Its greatest length is about 32 miles; its width varies between 3 and 8 miles.

Structure

The main feature of the island is the chain of over thirty volcanic peaks forming a central spine. Most of them are over 1,200 ft. high. Mount Washington (Mbuke

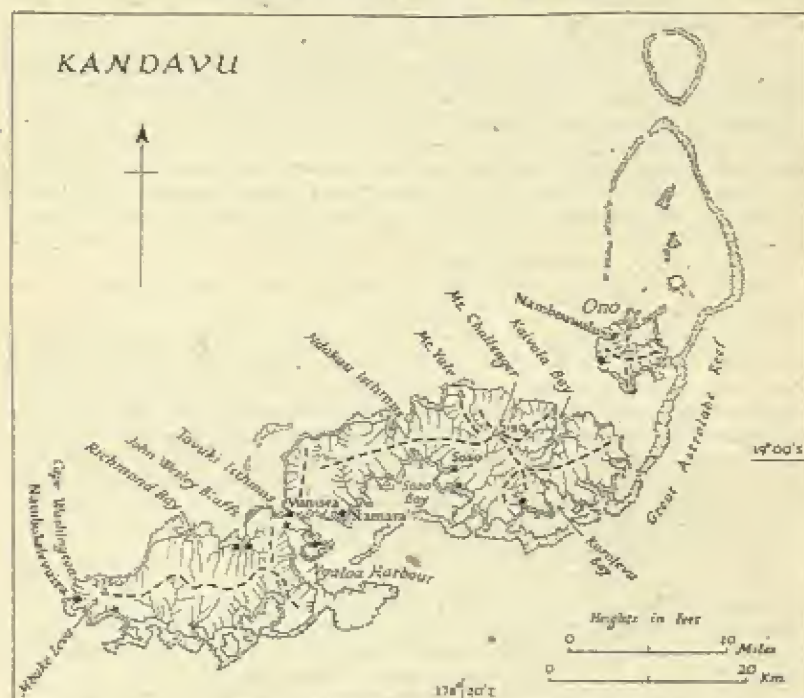


Fig. 77. Kandavu

Villages marked are those which in 1936 had 100 inhabitants or more. Based on: (1) Admiralty chart no. 167; (2) *A Report on the Fiji Census, 1936* (Suva, 1936); (3) other official sources.

Levu) (2,750 ft.), which forms the western end of the chain, and mount Challenger (2,180 ft.) are the highest. All but mount Washington are heavily eroded and dissected by radial valleys. Two subsidiary chains cross the main chain approximately at right angles, one to the west of the Tavuki isthmus and the other running from mount Yale on the north coast to a peak just west of Korolevu bay on the south coast. It is probable that Kandavu was once four separate islands that have been united by subsequent emergence of the land. Ono (in full, Ono i Kandavu) and several small islets scattered to the north-east and surrounded by the Great Astrolabe

reef were probably once united to Kandavu but have since been separated by marine erosion.

The drainage system is relatively simple. Numerous small streams, frequently without tributaries, flow down the ravines taking a very direct course to the sea.

Nowhere is there any continuous plain between the mountains and the coast; their slopes continue down to sea level or else end abruptly in cliffs. Only at the Tavuki isthmus and at the mouths of some of the streams are there small patches of fairly level ground.

Coasts

Kandavu has an intricate coastline with large bays, long inlets and many promontories. Fringing reefs occur everywhere except on the northern side of the western end where mount Washington slopes down to the sea. A barrier reef beginning opposite Ngaloa harbour on the south coast runs parallel to the shore from here to the eastern tip of the island. From this point it swings northward for about 25 miles, passing to the east of Ono and other small islands; finally doubling back, it runs in a southerly direction to the west of this group. This big loop is known as the Great Astrolabe reef. Between Ngaloa harbour and the northern end of the loop the reef is an almost continuous barrier broken only by four boat passages. The western end of the loop is by contrast a string of small coral patches interrupted by frequent passages and channels. Isolated patches of barrier reef occur off the north coast of Kandavu as far west as Namalata bay.

Beaches are generally fringed with reef, though there are sandy beaches at the heads of some of the bays.

From cape Washington, its western end, the coast of Kandavu trends roughly eastwards as far as Tavuki bay, which has a sandy beach to the north of which are John Wesley bluffs, precipitous cliffs about 300 ft. high. Due east of the bluffs is Namalata bay, forming one side of the Tavuki isthmus, which is low enough for Fijians to drag their canoes across. From Moindule point, about $3\frac{1}{2}$ miles to the north, the general trend of the coast right to Naingoro point, the eastern tip of the island, is a sweeping arc; but this trend is broken by several deep bays and inlets, notably Ndaku, Naseile and Kaivala bays; cliffs are absent.

Within the Great Astrolabe lagoon lie the islands of Ono i Kandavu, Mbulia, Ndravuni and Vanua Kula, with several small islets and rocks.

The southern coast is still more irregular in outline. From Naingoro point westward to Ngara Levu point there is a succession of narrow points separated by deep bays, the largest of which is Korolevu bay. A large bight further westward contains Soso bay and Ngaloa harbour. Within this harbour and close inshore is the roughly triangular island of Ngaloa, nearly 2 miles across. The western side of the harbour is formed by a mountainous, sandy-beached peninsula the tip of which curves round westwards to enclose Yauravu bay. Thence to cape Washington are several more coral-filled bays and capes, including the peninsulas of Koro i Rangi and Thikombia, each crowned with a conical hill. To the south-west of Yauravu bay and linked to the mainland by coral is the island of Matanuku. Denham, a small coral island, lies about $\frac{1}{2}$ mile from the coast and about $1\frac{1}{4}$ miles south-west of cape Washington.

Anchorage

There are no ports in Kandavu, though several natural harbours exist which could be provided with port facilities if commercial development warranted it.

Yauravu bay on the south coast provides anchorage for steamers in from 14 to 16 fathoms. Ngaloa harbour with Soso bay gives a vast sheltered anchorage with an inner harbour behind Ngaloa island. The main channel between the Pearl and

Esk reefs is about 700 yd. wide and 40 fathoms deep in the centre. Eastward of this are two smaller channels known as Boat channel and Schooner channel, the former being $3\frac{1}{2}$ fathoms deep and the latter about 200 yd. wide and 10-12 fathoms deep. The outer anchorage, south of Ngaloa island, has depths of 16-26 fathoms. The inner harbour between Ngaloa island and the Tavuki isthmus is land-locked; it has depths of 4-6 fathoms.

There are no other anchorages of importance on the south coast with the exception of Korolevu bay, at the head of which is Kandavu village. Anchorage is in 12 fathoms at the head of the bay. Anchorage is also possible in the Great Astrolabe lagoon, though only in areas free from coral heads. The bays on the north coast are less choked with coral than most of the south coast bays and therefore provide several anchorages sheltered by the land from the prevailing south-easterly winds.

Social and Economic Conditions

The native population was estimated to have been about 11,000 before the cession to Britain, but it has fallen considerably since then. The 1936 figure was 5,536. Kandavu has not shared in the general economic development of the colony. Plantations have never been developed, so native subsistence agriculture and production of copra for export are the chief activities. The villages are all on the coast. Vunisea at the head of Namalata bay is the government station. There are no roads, but native tracks link the villages.

TAVEUNI

Taveuni (Figs. 75, 76), which is the fourth largest island of the group, lies approximately between lat. $16^{\circ} 41'$ and $17^{\circ} 01'$ S and long. $179^{\circ} 54'$ E and $179^{\circ} 49'$ W. It is separated from Varundamu point, the nearest part of Vanua Levu, by the Somosomo strait, about 5 miles wide at its narrowest. The island's greatest length is about $25\frac{1}{2}$ miles and greatest width $9\frac{1}{2}$ miles, with an area of 168 sq. miles. Adjacent to its eastern shore are the smaller islands of Nggamea (26 sq. miles) and Lauthala (9 sq. miles).

Structure

The long, roughly parallel-sided island possesses a fairly simple structure. A very straight and continuous mountain ridge of volcanic origin forms its spine and contains one peak (Ulu i Ngalu) 4,040 ft. high and three others over 3,000 ft. To the north-east of Koroturanga (Des Voeux peak), 3,920 ft., lies a marshy crater lake. From the main ridge the land slopes down steeply on each side to the coast. The drainage system is very simple; numerous streams and cascades flow almost straight down the sides of the mountain ridge. Both sides are densely wooded, though the forest on the north-western or leeward side is of poor quality.

Coasts and Anchorages

In contrast to Kandavu, the coast of Taveuni is almost devoid of marked indentations and has very little coral. The only prominent capes are South cape, the southernmost tip of the island, Naselesele point, which forms the northern extremity, and Veitalathangi and Lavena points, roughly midway between these on the south-east coast. Fringing coral reef is more or less continuous round the northern end of the island from Lavena point on the south-east to Bleak point on the north-west. An isolated loop of barrier reef also occurs off Vuna point on the south-western end. A continuous stretch of cliffs about 4 miles long occurs midway

between South cape and Lavena point. All coasts have been affected by marine erosion, the northern tip of the island having been cut back about 10 miles. The resulting submarine platform on which stand Nggamea and Lauthala is roughly delimited by the 100-fathom line and fringed in parts by a barrier reef that embraces these islands.

Taveuni has no harbours. Several anchorages exist along the north-western coast, where shelter from the prevailing easterly winds is given by the mountain ridge.

Social and Economic Conditions

The population of Taveuni was 2,468 in 1936. It included a number of Europeans, mostly coconut planters and their families. The villages are all coastal, generally at the mouths of streams. Waiyevo is the government station.

Coconuts flourish in the rich soil. Cattle, which are abundant on the plantations where they are used to keep down the weeds, have also run wild on the mountains.

NGGAMEA AND LAUTHALA

Nggamea and Lauthala are both enclosed by the Taveuni barrier reef. Nggamea, a densely wooded island, is about $6\frac{1}{2}$ miles across from east to west and $4\frac{1}{2}$ miles from north to south. It has several high ridges radiating from a peak 1,000 ft. high in the centre. Its intricate coastline has narrow bays and long promontories where the ridges run down to the sea. The population in 1936 was 443, distributed among ten coastal villages.

Lauthala, separated from Nggamea by a channel between 1 and 2 miles in breadth, is $2\frac{1}{2}$ miles across at its widest, $\frac{1}{2}$ miles long and roughly L-shaped. The population of planters and their labourers totals about 50.

THE LOMAIVITI GROUP

The islands in the Koro sea ranging from Ovalau on the west to Ngau on the east can be considered together, since politically they form one of the native provinces and geographically are a self-contained unit separated by a wide expanse of sea from the Lau group to the east.

OVALAU AND MOTURIKI

Ovalau (lat. $17^{\circ} 40' S$, long. $178^{\circ} 48' E$) is a roughly oval island, 8 miles long and 6 miles wide, with an area of 40 sq. miles. It is less than 10 miles from the eastern coast of Viti Levu and within the barrier reef of the latter. In structure it is like a basin with a rim of eroded volcanic mountains encircling the central Lovoni valley. Nandelsivalau (2,053 ft.) in the eastern sector of the rim is its highest point. The Mbureta river finds its way from the valley through a gap in the south-western part of the rim. With the exception of settlements and coconut and pineapple plantations the whole island is densely wooded.

The coast is relatively simple in outline with but one large bay on the south side. Occasional sandy beaches occur and the whole coast is surrounded by fringing reef. There is only one anchorage of importance, Levuka harbour, on the east coast (pp. 217-9; Fig. 64).

The town of Levuka was formerly the capital of Fiji. In 1936 the population of Ovalau was 3,345. Many men find work in the shipping and commerce of Levuka; others are employed in coconut growing and copra making and at a pineapple plantation and cannery.



Plate 32. The Rewa river, Viti Levu

A view of the lower reaches, where the river flows through rich alluvial plains.



Plate 33. The Navua river, Viti Levu

A view of the lower reaches, where the river flows between high forest-clad hills.



Plate 34. Makongai: the southern coast

This is the 'clean' end of the island. In the centre can be seen the doctor's house with a road leading from it to the leper settlement.



Plate 35. Makongai: the main leper settlement

The nuns who act as nurses live on the hill at the top of the picture. The lepers live in the wards below, except the mild cases, who live in small villages scattered over this end of the island.

A motor road follows the east coast. Communication with other islands is provided by small sailing vessels and the inter-island steamers. There is telephone communication with Suva.

Moturiki is separated from the south-west coast of Ovalau by a channel about a mile wide. It is a narrow island, about 5 miles long and a mile wide. A range of low hills follows its main axis. The coast is surrounded by fringing reef which unites it to two small islands between its southern tip and Ovalau. The population, divided between eight villages, was 395 in 1936.

MAKONGAI AND WAKAYA

Makongai and Wakaya are both in the lagoons within a barrier reef shaped like a figure-8. The former is in the northern loop and the latter in the southern. The reef has few passages except in the northern side of the northern loop, where it is merely a chain of scattered shoals and patches.

Makongai (lat. $17^{\circ} 27' S$, long. $178^{\circ} 58' E$) is situated so close to the western side of the reef that it is united at several points to it by fringing reef. The island, which is of volcanic origin, is roughly oval in shape with several short promontories (Plate 34); the interior is occupied by four hills the highest of which, Ndiliendreti peak, is 876 ft.

Makongai is a leper asylum (p. 188). The island is divided into a 'clean' area in the south, including Nasau village where the staff live, and a hospital area (Plate 35) in the north where the patients are segregated. Advanced cases live in the hospital on the shore of Ndalithe bay, while milder cases live in normal fashion in villages where they grow their own food. Amenities and recreations include a cinema, model-yacht racing and cricket. At Nasau there are dairy herds, a soap factory and repair shops.

Nasau is linked with the hospital area by a motor road. W/T communication is maintained with Levuka. There are two jetties for small craft in Ndalithe bay near the hospital; anchorage is in from 10 to 14 fathoms. Shelter is afforded by the small uninhabited island of Makondronga less than a mile offshore. The total population of Makongai in 1936 comprised 119 members of the hospital staff and labourers and 570 patients.

Wakaya is situated about 8 miles south of Makongai and 9 miles eastward of Ovalau. It is about 9 miles long, tapering from a width of about $1\frac{1}{2}$ miles in the north to a narrow point in the south. The northern part rises to a height of 600 ft. on the west coast, where there are precipitous cliffs. The slope from the crest to the east coast is more gradual.

The whole coast is reef-fringed. On the west it joins the barrier reef, while on the north and east a normal fringing reef occurs. Two ship passages to the north-west of the island provide entrance to the reef; the northern and deeper one has depths of 10-20 fathoms. There are no native villages.

MBATIKI

Mbatiki (lat. $17^{\circ} 46' S$, long. $179^{\circ} 10' E$) is of volcanic origin. It is about $2\frac{1}{2}$ miles long and 1 mile wide, with an area of 4 sq. miles. It is roughly circular with two deep indentations in the south and west coasts which almost sever the southern tip from the rest of the island. The highest points are two hills, 284 and 609 ft. high respectively, in the northern part of the island. Fringing reefs surround the coast and are linked at three points to a barrier reef about $\frac{1}{2}$ mile offshore. There are three boat passages through the reef on the north side of the island.

The 1936 population of 291 inhabited four villages. Banana growing, copra manufacture and the collection of trochus shell are important pursuits.

NAIRAI

Nairai, about 14 miles to the east of Mbatiki, is also of volcanic origin. With an area of 9 sq. miles, it is about 4 miles long and less than 2 miles in average width. In shape it is a narrow ellipse with its long axis north and south. At the north end projects a massive promontory running eastwards. The central mountain spine follows the long axis from the southern end and then bends eastward into the promontory; at the bend occurs the highest point, Koro Vatu (1,078 ft.). The coasts are surrounded by a narrow fringing reef which broadens out at the north-west corner of the island. A massive barrier reef of triangular shape is separated from the coast by a lagoon which is in most parts a mile or more wide. There are two entrances through the reef midway between the western and southern angles. Safe anchorage is obtainable off the village of Tovu Lailai on the west coast.

The 1936 population of 346 was grouped in seven villages scattered round the coasts. Bananas, copra and trochus shell are the chief export products.

NGAU

Ngau (lat. $18^{\circ} 07' S$, long. $179^{\circ} 19' E$), the largest of the Lomaiviti group, has a north-south length of $11\frac{1}{2}$ miles, an average east-west width of $4\frac{1}{2}$ miles and an area of 54 sq. miles. A central chain of mountains of volcanic origin runs the length of the island, with several subsidiary ranges branching off to east and west. The highest peaks are Ndelaitho (2,345 ft.) and Ndelaithomboni (2,313 ft.), at the northern end of the range. Several short streams run down through a narrow coastal plain to the sea. A narrow peninsula projects southward from Lion peak on the north-west of the island.

A fringing reef surrounds the coast. On the east it is in places a mile-wide. The west coast has in addition a long almost unbroken stretch of barrier reef, united to the southern tip of the island but divided from the northern tip by entrance passages. The central channel through the barrier reef has a least depth of 4 fathoms. Sheltered anchorage is obtainable in Herald bay and in the bay south of Lion peak.

The 1936 population of 1,496 people lived in 17 villages, most of them on the coast. Trochus shell, bananas and copra are exported.

KORO

Koro (lat. $17^{\circ} 20' S$, long. $176^{\circ} 25' E$) lies about midway between Makongai and the south-west tip of Taveuni. Of volcanic origin, it is shaped like an inverted triangle with its apex to the south. It is about 12 miles long from north to south and 6 miles wide at the northern end, the area being about 40 sq. miles.

A range of hills rising to 1,840 ft. at its highest point runs diagonally through the island. Narrow strips of coastal plain occur to east and west, while on the north coast the plain runs inland to a depth of about a mile. The whole island is densely wooded.

The coasts are fairly simple in outline and have no marked indentations. At the north-west, Nola point, and the southern extremities there are sharp promontories. Fairly continuous fringing reef follows the east coast, but on the north and west there are long stretches without coral.

The fourteen coastal villages housed a total population of 1,563 in 1936. Excellent bananas and copra are produced.

THE YASAWA GROUP

The Yasawa group (Fig. 78) is a chain of islands nearly 50 miles long running approximately from north-east to south-west and situated just within the north-western edge of the submarine platform on which Viti Levu stands. The islands have few contacts with the rest of Fiji. The population consists almost exclusively of Fijians, who practise subsistence agriculture and export some copra which is transported in small cutters to Lautoka.

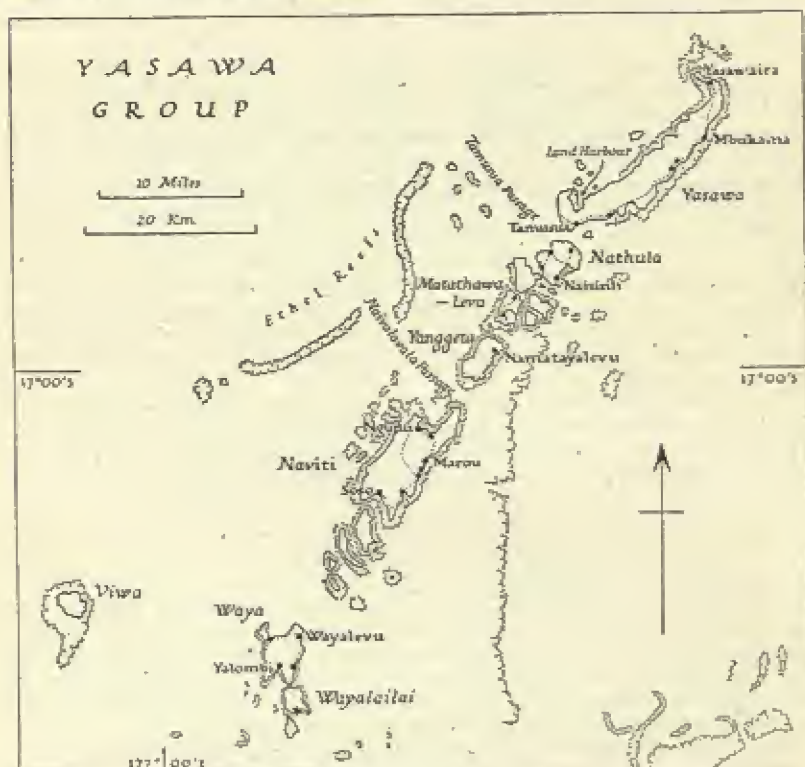


Fig. 78. Yasawa group

The seaward edge only of the barrier reef to the east of Naviti and Wayalevu has been charted; its shoreward extent is unknown. All villages are marked. Based on A.M.S. map, Colony of Fiji, nos. 1 and 4, 1942. Major variations in coastline are seen when this map is compared with G.S.G.S. map no. 4295 and with Admiralty chart no. 2691.

Yasawa island (lat. $16^{\circ}49'S$, long. $177^{\circ}29'E$) is the most northerly of the group. It is about 13 miles long and has an average width of 2 miles. Its northern and southern extremities turn westwards, roughly at right-angles to the main mass of the island, which consists entirely of a long hilly ridge rising to a maximum height of 781 ft. The coast is completely surrounded by fringing reef. Off the south-western tip is the small islet of Yasawa i Lau. The 1936 population was 610.

Nathula, separated from Yasawa by the Tamusua passage, about a mile wide, is an irregularly shaped island about 3 miles in greatest breadth. The south-eastern side has a large bay about midway along it. Its population was 456 in 1936. Between Nathula and Matathawa Levu are the three small islets of Tavewa and Nanuya Lailai and Nanuya Levu.

Matathawa Levu, approximately 2 miles from north-east to south-west and $1\frac{1}{2}$ miles from north-west to south-east, is semicircular, the enclosed bay facing south-east. The population was 108 in 1936.

Yanggeta, separated by a strait about 1 mile wide from Matathawa Levu, is a narrow island about $3\frac{1}{2}$ miles long and $1\frac{1}{2}$ miles wide. In 1936 there were 189 inhabitants.

Naviti, the largest of the group, is separated from Yanggeta by the Naivalavala passage, about 2 miles wide. About 9 miles long, it is 3 miles across at the widest part. The coasts of the longer eastern and western sides are prolonged at each end into narrow peninsulas, so that the north and south sides are each a large bay. There are several villages with a total population of 752 in 1936. Off the southern tip are the small islets of Ndrawangga, Naukathuvu, Nanuya Mbalavu and Narara.

About 8 miles from the southern tip of Naviti lies the island of Waya. It is roughly circular, about 4 miles across, with several short promontories on all sides. It is well wooded, with several sharp peaks, the highest of which is 1,874 ft. Between the south-western and south-eastern promontories is Alacrity bay with anchorage on sand and mud in 14 fathoms. There was a population of 544 in 1936.

Off the south-east promontory lies the smaller island of Waya Lailai, which rises to a thumb-shaped peak 1,160 ft. high. About a mile to the south of this again is the islet of Kowata.

Viwa island (lat. $17^{\circ} 09' S$, long. $176^{\circ} 54' E$) lies about 13 miles north-west of Waya, on the Great Sea reef; it is roughly circular, about 2 miles across and only 7 ft. above sea level. It has its own fringing reef that extends in an unbroken area for 2 or 3 miles to the south. Its population was 204 in 1936.

THE LAU GROUP

The Lau group, the easternmost of the archipelago, has several characteristics distinguishing it from the rest of Fiji. All the islands are small and isolated. Few vessels except native cutters link them with the main islands to the north and west. The population, with the exception of a few Chinese and Indian traders, consists of Fijians, who produce copra in times of good prices, but in times of economic depression rely solely on subsistence agriculture and fishing.

Structurally, the islands of the group are of three main types—volcanic, limestone, and volcanic with limestone combined (Fig. 79).

The islands of Moala, Totoya and Maruku, though lying somewhat to the west, are normally included in the Lau group. They are the eroded summits of ancient volcanoes that rise from the sea bed in great depths. Well forested on the higher ground, they have the lower slopes covered with reeds. Stretches of coastal plain where they occur are covered with coconut palms. Numerous short streams flow down to all coasts. The islands are densely wooded and good water is obtainable.

MOALA

Moala (lat. $18^{\circ} 35' S$ and long. $179^{\circ} 57' W$) has approximately the form of a letter-F, with the vertical stroke almost north and south. The north coast is about $7\frac{1}{2}$ miles and the west coast about 6 miles long. Mountain ridges follow the main axes of the island and include eight peaks over 1,000 ft. high. The bay between the horizontal

arms marks the site of the former crater. The coast has few marked promontories. A large bay occurs roughly centrally on each of the north and west coasts and on the southern side of the northern arm. Streams flow into them and form marshes at their heads. Fringing reef surrounds the island and on the western part of the north coast is nearly a mile wide. A barrier reef lies off the western and eastern coasts

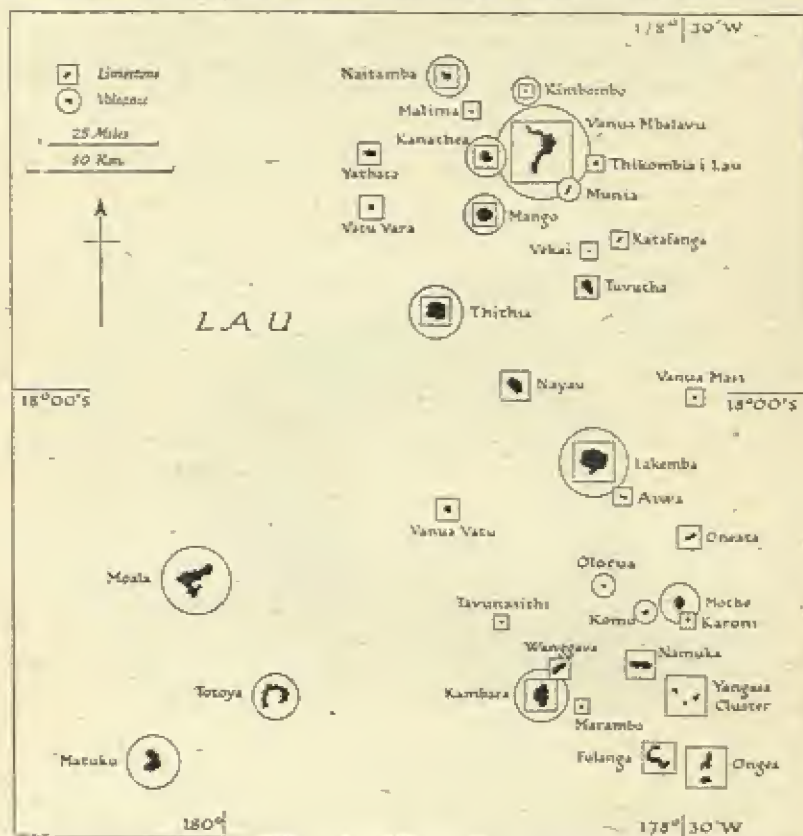


Fig. 79. Lau group: geology

Vatua and Ono i Lau are too far to the south to be shown on this map. Based on: (1) G.S.G.S. map no. 4295 (Cassini's projection); (2) R. A. Derrick, *The Geography of the Fiji Islands*, pp. 135-54, *passim* (Ndavuilavu, 1938); (2) A. Agassiz, 'The Islands and Coral Reefs of Fiji', *Bulletin of the Museum of Comparative Zoology at Harvard College*, vol. xxxiii, *passim* (Cambridge, Mass., 1899); (3) E. C. Andrews, 'Notes on the Limestones and General Geology of the Fiji Islands, with Special Reference to the Lau Group', *Bulletin of the Museum of Comparative Zoology at Harvard College*, vol. xxxviii, *passim* (Cambridge, Mass., 1900).

and off the southern tip encloses a lagoon possessing depths of 10-20 fathoms. There is an anchorage in the crater bay, but the approach is not suitable for large vessels. In 1936 the population, 852 in number, lived in 9 coastal villages. Coconuts, native fruits and vegetables, poultry, pigs and fish are obtainable, but some of the local species of fish are poisonous.

TOTOYA (Fig. 80)

Totoya, lying 21 miles south-east of Moala, is crescent-shaped, with the opening to the south, and evidently represents the walls of a crater which has been pierced and flooded by the sea. The circumference of the wall is nearly 12 miles, while the width varies from less than $\frac{1}{2}$ mile to 1 mile. The wall is crowned by a series of over thirty peaks, the highest of which is 1,184 ft. The crater lagoon, which is 3 miles in diameter, has depths of around 30 fathoms; it contains very few coral heads. The outer coast has several cliffed promontories, where spurs from the peaks



Fig. 80. Totoya

Based on Admiralty chart no. 1248.

run down to the sea; the bays between them have sandy beaches. Fringing reef surrounds both inner and outer shores. A barrier reef encircles the island. It is nearly continuous on the west, south and east coasts, but a mere chain of coral patches on the north. Anchorage is obtainable in Herald sound, the lagoon between the barrier reef and the west coast. A deep entrance over a mile wide gives access through the reef. Anchorage in 25 fathoms within the sound is sheltered and has good holding ground. The 1936 population of 598 was divided between four villages, two on the inner and two on the outer coasts.

MATUKU

Matuku lies 21 miles to the south-west of Totoya. It is 4 miles long with an average width of 2 miles and an area of 11 sq. miles. The shape is oval, with a wide bight forming the harbour in the west coast. The interior is hilly with many small peaks, the two highest of which exceed 1,200 ft. in height. Sandy beaches occur round much of the coast, particularly in shallow bays separated by small cliffed promontories. Mangroves fringe the shores of the harbour. Small patches of fringing reef occur on all coasts, while an almost unbroken barrier reef surrounds the island at a mile or less from the shore. The harbour gives good sheltered anchorage in 18 fathoms. It is entered by a channel nearly 300 yd. wide with depths of about 30 fathoms. The population in 1936 was 696.

WAILANGILALA

Wailangilala (lat. $16^{\circ} 45' S$, long. $179^{\circ} 06' W$) is a pear-shaped atoll with two small reef islets, Wailangilala and Thakaundrove, at its northern tip. They are composed of limestone with superficial deposits of sand and coral and covered with coconut palms and scrub. Wild pigeons are abundant. Wailangilala is roughly triangular in shape, about 1,100 yd. long and 700 yd. wide, with a height of 15 ft. on its eastern end. Thakaundrove, 400 yd. to the north-east, is a pear-shaped islet 400 yd. long and 200 yd. wide. There is a boat passage in the western side of the reef. The enclosed lagoon has depths of 20-23 fathoms. Lighthouse keepers are the only inhabitants.

NAITAMBA

Naitamba is a triangular volcanic and limestone island about 3 sq. miles in area which lies 18 miles south-westward of Wailangilala. The whole island is wooded and contains a central depression. The elevated coastal fringe reaches a height of 610 ft. on the south. The north and south-east coasts have high cliffs; on the south-west is a sandy beach. A barrier reef surrounds the island at a distance of nowhere more than $\frac{1}{2}$ mile from the coast. An entrance through the western side gives access to one small village with a population of 54 in 1936. Good quality fresh water is obtainable at the settlement. The island is utilized for copra production.

KIMBOMBO ISLETS

The Kimbombo islets (lat. $17^{\circ} 03' S$, long. $179^{\circ} 02' W$) are a group of three small uninhabited islets in a lagoon enclosed by an oval reef. The highest is of volcanic structure and densely wooded; the other two are of limestone and support coconut palms.

YATHATA AND KAIMBU

Yathata and Kaimbu (lat. $17^{\circ} 15' S$, long. $179^{\circ} 28' W$) are two islands united by a fringing reef nearly a mile wide. Yathata is an approximately oval island about $2\frac{1}{2}$ miles long from east to west and $1\frac{1}{4}$ miles from north to south. It rises to a height of 840 ft. with two central peaks. Kaimbu is a long narrow island about $1\frac{1}{2}$ miles long and $\frac{1}{2}$ mile wide. Population figures are not available, though a village is charted on the coast of Yathata.

KANATHEA

Kanathea lies about 19 miles west of Kaimbu. It is approximately circular with a diameter of about 2 miles and has seven peaks, the highest of which is 830 ft.

There is a wide fringing reef on the north and south sides; on the south it encloses a narrow lagoon and on the east forms a large loop trending north-eastwards almost as far as Nggilanggila. The population in 1936 was 114.

THE EXPLORING ISLES (Fig. 81)

'The Exploring isles' is the name given by the United States Exploring Expedition in 1840 to a scattered group of islets enclosed within a barrier reef, lying approximately between lat. $17^{\circ}04'$ and $17^{\circ}24'S$ and long. $178^{\circ}40'$ and $179^{\circ}04'W$.

Vanua Mbalavu, the main island, is shaped like a question mark and following



Fig. 81. Exploring isles and adjacent islands

The term 'Exploring isles' is limited to Vanua Mbalavu and the other islands within the large circuit of barrier reef. Based on: (1) Admiralty chart no. 416; (2) R. A. Derrick, *The Geography of the Fiji Islands*, p. 144 (Ndavuilavu, 1938); (3) G.S.G.S. map no. 4295.

its curvature is 14 miles long with a greatest width of nearly 3 miles. Its area is 20 sq. miles. The wide central part is volcanic in origin, whereas the two ends are of raised coral limestone. The peak of Koro Mbasanga occupies the centre of the middle portion, while a ridge of lesser height forms a spine for the rest of the island. High limestone cliffs occur on the deeply indented northern coast and round much of the large bight which forms the west coast. The east coast, by contrast, has mainly sandy beaches. A narrow fringing reef surrounds the southern half of the west coast and all of the east and much of the north coasts.

A population of 1,681 in 1936 was divided between 10 coastal villages. Lomaloma, the most important of them, has a considerable population of Tongans. It is also the headquarters of the District Commissioner for the Eastern District.

Nggilanggila is an elevated limestone island with precipitous cliffs (Fig. 82); it is uninhabited. Namalata, about $1\frac{1}{2}$ miles long and of oval outline, and Susui, about $2\frac{1}{4}$ miles long, are both parts of the elevated reef forming the southern tip of Vanua Mbalavu. They had populations of 65 and 107 respectively in 1936. Munia is oval in shape, about $2\frac{1}{4}$ miles long and 1 mile broad, with a central peak 950 ft. high; it is united to the barrier reef. In 1936 it had a population of 20. Thikombia i Lau is a limestone rock 230 ft. high, about $1\frac{1}{2}$ miles in diameter, with a population of 63. Aves is a wooded limestone island 600 ft. high, with a population of 70 in 1936.

There are seven navigable passages through the barrier reef: three in the middle



Fig. 82. Cañon on the east shore of Nggilanggila island

Note the undercutting of the limestone cliffs by wave action. Based on A. Agassiz, 'The Islands and Coral Reefs of Fiji', *Bulletin of the Museum of Comparative Zoölogy at Harvard College*, vol. XXXIII, plate 74 (Cambridge, Mass., 1899).

of the northern side, opposite the Sovu islets; two wide ones—American and Tongan passages—in the south-east side; Nggilanggila passage, opposite that island; and Andavathi passage, opposite the bight in the west coast of Vanua Mbalavu.

VATU VARA

Vatu Vara (lat. $17^{\circ} 26' S$, long. $179^{\circ} 32' W$) is a densely wooded circular island, lying 9 miles to the south of Yathata. It is a mile in diameter and rises in the middle to a hill 1,030 ft. high, the highest point in the Lau group. From its distinctive profile with flat top and steep sides rising from a low coastal plain, it was formerly named Hat island. The whole coast is surrounded by fringing reef. It is uninhabited.

MANGO (Figs. 36, 81, 83)

Mango (lat. $17^{\circ} 27' S$, long. $179^{\circ} 09' W$) is a circular island about 4 miles across, lying 8 miles to the south of Kanathea. Its geology is shown in Fig. 36. A small stream flows north-east to a little bay on the coast, cutting through what would otherwise be a circular rim of hills just inland of the coast. Narrow fringing reef, lagoon and barrier reefs surround the island. The small bay serves as an anchorage and has a pier. Lighters and boats drawing 4 ft. can cross the reef at high water. The island is privately owned and worked as a copra estate; in 1936 the population of 139 consisted of the owner's employees.

KATAFANGA

Katafanga lies 13 miles south-east of Munia. It is less than a mile long, crescent-shaped and 180 ft. high. It lies in the western end of a shallow lagoon almost



Fig. 83. Weathered limestone rocks on the shore of Mango

Note the jagged shapes and characteristic undercutting. Based on E. C. Andrews, 'Notes on the Limestones and General Geology of the Fiji Islands, with Special Reference to the Lau Group', *Bulletin of the Museum of Comparative Zoölogy at Harvard College*, vol. xxxviii, plate 14 (Cambridge, Mass., 1900).

enclosed by barrier reef, in the north side of which there is a boat passage. There is a small settlement, with a population of 12 in 1936, on the south-east side.

TUVUTHA, THITHIA, AND NAYAU

Tuvutha, lying about 20 miles south of Munia, is triangular in shape, about $3\frac{1}{2}$ miles long and nearly 2 miles wide, with an area of 5 sq. miles. It rises to a height of 800 ft. at the northern end where the hills fall away in steep bluffs to the sea. In the centre is a basin containing four or five small lakes and draining towards the south-east. An almost continuous barrier reef encloses a narrow lagoon; there is a boat entrance in the western side. The population (76 in 1936) lives in a village on the south-west coast.

Thithia (lat. $17^{\circ} 45' S$, long. $179^{\circ} 18' W$) lies 23 miles westward of Tuvutha. It is approximately circular, 3 to 4 miles across, with an area of 13 sq. miles. The interior is occupied by a number of grass-grown hills with scattered pandanus and casuarina trees. The central ridge (540 ft.), which is volcanic, has masses of raised limestone on its sides. The sandy beach is fringed throughout by reef. Anchorage in southerly and easterly winds is obtainable in a bight of the reef on the north-west side. Five coastal villages contained a total population of 560 in 1936.

Nayau (lat. $17^{\circ} 38' S$, long. $179^{\circ} 03' W$) lies about 20 miles south-west of Tuvutha. It is oval, densely wooded, about $3\frac{1}{2}$ miles long by $2\frac{1}{2}$ wide, with a coastal fringe of hills which drop precipitously to the sea from heights of between 500 and 600 ft., and a central basin-shaped depression. Its beaches are mostly sandy and are surrounded by fringing reef. Boats can pass round the island within the reef at

half tide, entering by a passage 15 yd. wide on the east coast. In 1936 the population was 392. The paramount chief of Lau (*Tui Nayau*) derives his title from this island.

LAKEMBA AND NEIGHBOURING ISLANDS

Lakemba (lat. $18^{\circ} 12' S$, long. $178^{\circ} 47' W$) is the largest island of the Lau group and its traditional political centre. It is of oval shape, with its long axis running from east to west, and has a promontory projecting from the middle of its south coast. The greatest length is nearly 6 miles and greatest width 5 miles, giving an area of 22 sq. miles. The central peak of Kendekende (720 ft.) is volcanic and has elevated masses of older limestone on its north-western and western sides.

Sandy beaches occur all round the coast, which is encircled by a wide fringing reef; a loop of narrow barrier reef on the east coast encloses a rhomboidal lagoon full of coral patches. Steamer passage enters it on the east, giving access to anchorage in 13 fathoms in the lagoon. Fish and turtle are abundant, the latter in the hot months. The population of 1,681 (in 1936) was divided between eight coastal villages.

About 7 miles to the south-east is the narrow uninhabited islet of Aiwa within a narrow circuit of reef.

Oneata, a narrow islet $2\frac{1}{2}$ miles long and less than a mile wide, lies in a shoe-shaped lagoon about 21 miles south-east of Lakemba. It has a central depression and several small hills on the coast, the highest rising to 160 ft. The small islet of Loa is $\frac{1}{2}$ mile off the eastern tip. There are three passages through the western side of the reef and one in the centre of the northern side. The population totals 220.

Vanua Vatu, about 25 miles south-west of Lakemba, is a raised limestone islet with a central depression and a maximum height of 310 ft. on the coastal rim; it is almost circular and about 1 mile in circumference. A barrier reef, with one boat passage on the west, encloses the island within a narrow lagoon. The population was 136 in 1936.

THE SOUTHERN ISLANDS

Olorua (lat. $18^{\circ} 37' S$, long. $178^{\circ} 44' W$) is a small steep island, in origin a much eroded volcanic cone, set on the northern fringe of a solid triangle of reef; a narrow lagoon protected by a further reef fringes the northern shore. It is uninhabited.

Komo is a volcanic island about 9 miles south-west of Olorua and occupies the eastern end of a lagoon enclosed by an oval reef. It is about $1\frac{1}{2}$ miles long and less than $\frac{1}{2}$ mile wide. The central peak rises to 270 ft. A narrow fringing reef surrounds the coast. Two boat passages enter the lagoon at its east and west ends. The island is noted for red ochre, which the Fijians use for stencilling their bark cloth. The 1936 population was 158.

Mothe (lat. $18^{\circ} 39' S$, long. $178^{\circ} 30' W$) is a volcanic cone (590 ft.). Almost circular and about 2 miles in diameter, it has a slightly indented sandy-beached coast fringed with reef. An unbroken barrier reef encloses a narrow lagoon which extends in a long loop south-eastwards from the south coast and encloses the small limestone islet of Karoni.

Tavunasithi is a wooded coral islet about $\frac{1}{2}$ mile in diameter, lying 25 miles south-west of Olorua. It is completely surrounded by wide fringing reef which boats can cross at half tide.

Namuka (frequently known as Namuka i Lau) is a limestone island 5 miles in length from west to east and little more than 1 mile from north to south. It lies about 12 miles south-west of Mothe. It has a raised coastal ridge rising to 260 ft. on the north. Midway along the south coast is a coral-filled bight; a similar but

smaller bay occurs at the west end. A barrier reef surrounds the whole island, being complete on all sides but the north-west where there is a boat passage through a chain of coral patches. The harbour in the lagoon on the north side has fair anchorage in 7-13 fathoms. The population was 269 in 1936.

Vuanggava lies 13 miles to the south-east of Tavunasithi. It is a limestone island with a coastal ridge rising to 359 ft. and a central depression in which is a small brackish lake. The coast on the western end and along the south-east side is bordered by continuous fringing reef. The island is uninhabited but planted with gardens by natives of Kambara, who also use the central lake for breeding turtles.

Kambara, 3 miles to the north-west of Vuanggava, is an oval limestone island about $4\frac{1}{2}$ miles from north to south and 3 miles from east to west. The centre is a wooded basin; the coastal ridge attains a maximum height of 470 ft. on the north-west. Steep limestone cliffs overlook the beach. The surrounding reef is of fringing type on the east coast. On the west a narrow barrier reef encloses a lagoon. Good anchorage is obtainable off the north-west shore. The population of 418 (in 1936), noted as canoe builders, is divided between 4 coastal villages (Fig. 49).

Marambo, 7 miles east of Kambara, is a circular limestone islet 160 ft. high, less than a mile in diameter and surrounded by a fringing reef. It is uninhabited and has no anchorage.

The Yangasa cluster, a group of four small limestone islands—Navutuirā, Yuvutha, Navutuiloma and Yangasa Levu—within a circuit of barrier reef, lies 4 miles south-east of Namuka. Yangasa Levu, the largest, is less than 2 miles long, while Yuvutha, the smallest, is less than $\frac{1}{2}$ mile in diameter. They are uninhabited but contain coconut plantations owned by the people of Mothe.

Fulanga, about 8 miles south-west of the Yangasa cluster, is an almost circular limestone island of atoll type, with a central lagoon studded with rocks and islets. Its greatest diameter is about 5 miles and its area 7 sq. miles. The north side of the atoll is broken into a chain of small islets separated by channels linking the internal lagoon with the sea. The south-western side contains a large sandy-beached bight on its seaward side. The whole seaward coast of the island is fringed with coral which encloses several narrow stretches of lagoon. The population (390 in 1936) lives in three villages.

Ongea Levu (lat. $19^{\circ} 10' S$, long. $178^{\circ} 25' W$) and Ongea Ndriki are two limestone islands within a single barrier reef. Ongea Levu, about 4 miles long, is centrally placed within the reef, while Ongea Ndriki, less than 2 miles long, is attached to the southern part of the reef. The only village, with 105 inhabitants in 1936, is at the head of a sand-filled bay on the southern end of Ongea Levu. The lagoon has the best anchorage in the southern part of the Lau group, access being gained by the Barracouta passage through the reef at its south-west corner. It is more frequently visited by ships than any of the neighbouring islands.

VATOA AND ONO I LAU

The island of Vatoa and the Ono group lie in the far south of Lau, separated from the other southern islands by a broad stretch of sea.

Vatoa (lat. $19^{\circ} 49' S$, long. $178^{\circ} 13' W$), discovered by Cook and named by him Turtle island, is 45 miles to the south of Ongea Ndriki. It is a densely wooded strip of coral about 2 miles long with a hill 209 ft. high at the northern end. It lies within an elongated barrier reef which is contiguous with the south-eastern coast. Good water is plentiful at the foot of the hill. The one village had a population of 171 in 1936.

Ono i Lau (lat. $20^{\circ} 39' S$, long. $178^{\circ} 42' W$) comprises a group of 6 islands 100 miles south of Ongea Ndriki. The main island, Ono Levu, which gives its name to

the group, is crescent-shaped and about 3 miles long. It contains two prominent peaks, the higher of which reaches 370 ft. The enclosed bight is sandy-beached while the outer shore is mostly coral-fringed. Opposite the bight are the smaller islands of Ndoi and Ndavura. All three are volcanic in origin and form the remains of the rim of an extinct crater. The group is surrounded by a lagoon enclosed by a barrier reef having two boat entrances. The three remaining islands, Undui, Yahuja and Mana, with several small islets, are of coral formation and located on the barrier reef. The inhabitants, who numbered 586 in 1936, live on Ono i Lau and Ndoi.

(For Bibliographical Note see Chapter V.)

Chapter VII

ROTUMA, UVEA AND FUTUNA

Rotuma: Uvea (Wallis island): Futuna and Alofi (Hoorn islands):
Bibliographical Note

ROTUMA

Rotuma (pronounced with stress on the second syllable) lies in lat. $12^{\circ} 30' S$, long. $177^{\circ} 05' E$, about 300 miles north of the Yasawa group in Fiji. To the north-west and west of Rotuma lie three small islets: Uea (not to be confused with Uvea, Wallis island, or with Uvea in the Loyalty islands, sometimes also written Uea), Hatana and Hofiua. Rotuma is a dependency of the Colony of Fiji.

PHYSICAL GEOGRAPHY

Structure

Rotuma and its off-lying islets are all of volcanic formation. Rotuma itself is divided into two mountainous areas by a sandy isthmus about $1\frac{1}{2}$ miles in length and very narrow. The eastern part is about 6 miles long and $2\frac{1}{2}$ miles wide; the western part is about $1\frac{1}{2}$ miles in each direction (Fig. 84).

In the centre of the eastern part of the main island is a complex range of hills. The height of the peaks on this range varies from 840 ft. at Suelhof, the highest point, to about 500 ft. or less. On most of the hill-tops are depressions, which represent the partly filled craters of ancient volcanoes. The upper slopes are steep, but gradually flatten out towards sea level. The hills are of a porous lava, and large lava blocks are scattered over the lower slopes. Below the slopes is a beach-sand formation running round the coast and reaching its maximum width of nearly $\frac{1}{2}$ mile round the village of Oinafa off the north-eastern end of the island. Here there are swamps, often below sea level, with pools sometimes several feet deep in which the water is brackish.

The western half of the island rises sharply from the isthmus in a range of hills running to its south-eastern corner. This range is divided by a valley from the high wooded peak Soloroa in the north, and by a plain about $\frac{1}{2}$ mile wide from the mountains on the west.

There are no rivers in the true sense on Rotuma, but many channels

have been cut in the hillsides in places and drain into the swamps. Two springs flow perennially out of the rock between tidemarks, at Noatau and Lópta respectively. Water is normally obtained by catchment from the iron roofs of houses and stored in tanks, which according to regulations must be covered with mosquito-proof netting. In 1928 there were 27 communal cisterns and 152 private tanks.

Uea is of a conical form, rising to 860 ft., with cliffs almost reaching the summit on the north side. There is no fringing reef; the island is steep-to, and landing is usually effected by swimming. There are a few houses scattered about the comparatively flat area to the east

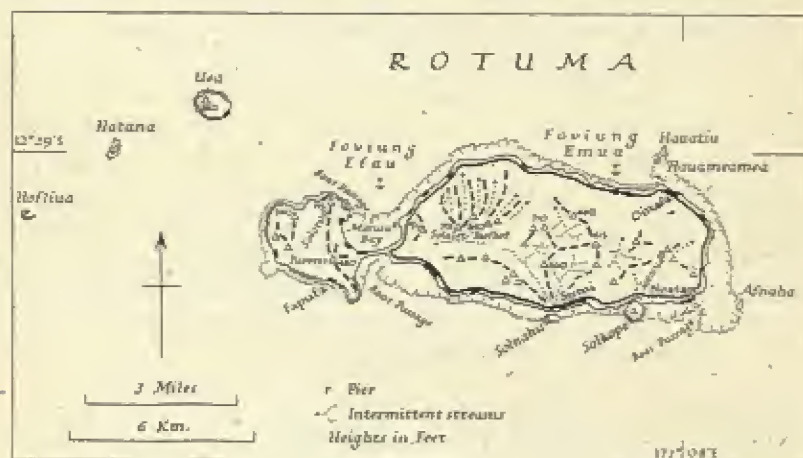


Fig. 84. Rotuma

For general key to symbols see pp. 10-11. Based on Admiralty chart no. 2992.

of the hill. To the south-west of Uea are the islets of Hatana and Hoffiua. The former is some 60 ft. high and wooded, while the latter reaches a height of 90-100 ft. with cliffs all round. Off the south coast of Rotuma are two wooded islands, Solnahu and Solkope. The latter has cliffs on the outer side.

Coast

Rotuma is fringed by a reef which dries out in places to a depth of 2 ft. Boat passages are cut in this reef, opposite Noatau on the south-east of the island and in the bays north and south of the isthmus. Three small islands stand on the reef, one off the south-

eastern extremity and two on a northward projection of the reef opposite the north-east of the island.

The most prominent feature of the coastline seen from the north is Fadaetua point, where the bluff of Solorua, with a red sandstone face, rises above steep cliffs about 200 ft. high. This marks the western end of Motusa bay. This bay is about $1\frac{1}{2}$ miles wide, with a sandy beach. It is marked on its eastern extremity by the Resident's house, a prominent building which is easily distinguishable, and by the wireless telegraph station. The head of the bay is shut in by the reef, which virtually fringes the whole island. There is a boat passage which is available only from half tide to full tide. From Motusa bay to Oinafa a stretch of sandstone formation slopes gently into the sea and the reef follows the coast fairly closely until, at Oinafa, it runs northward for about a mile to the islet of Hauatiu. The reef is at its greatest distance from the island opposite Noatau on the south-east corner, where there is a boat passage. The east and south coasts are sandy, except near the islet of Solkope, where there are cliffs.

To the south of the isthmus there is a bay similar to that on the north, with a boat passage through the reef. The western end of this bay is the only point where the land projects beyond the reef. Here steep cliffs fall straight into the sea. The remaining coastline is alternately cliff or sandy beach. A stretch of cliff about 30 ft. high runs along the west coast of the island.

Anchorage and Landings

Anchorage may be had at Foviung Efau in 11 fathoms about 600 yd. from the reef at the head of Motusa bay, and at Foviung Emua west of Hauatiu island in $6\frac{1}{2}$ fathoms. There is also an indifferent anchorage $1\frac{1}{2}$ miles west of Afnaha.

The regular landing is in Motusa bay, entered by a boat passage through the reef. There is a small stone jetty near the Residency, and there are also two wooden stagings. In good weather the beach can be approached at high water from almost any direction. At low water the reef is dangerous, and parts of it are awash. It is also possible to land on the beach opposite the Foviung Emua anchorage.

Climate

The climate of Rotuma is rather hot and damp during most of the year, but in the winter months (June to September) it is somewhat cooler and is pleasant. From April to November the south-east trade wind provides a fairly constant breeze on the windward

side of the island during the hotter part of the day; it drops light at sundown. Skies are only slightly clouded during the morning, but become increasingly covered as the afternoon draws on. During this cloudy period, between about 1300 and 1700 hr., there is rain, sometimes heavy and prolonged, on at least fifteen days in a month. Shortly before sunset the sky begins to clear, and nights are not usually more than five-tenths covered. Mean temperatures are highest in the months of January, February and March, and

MONTHLY RAINFALL, ROTUMA

(Mean compared with sample years)

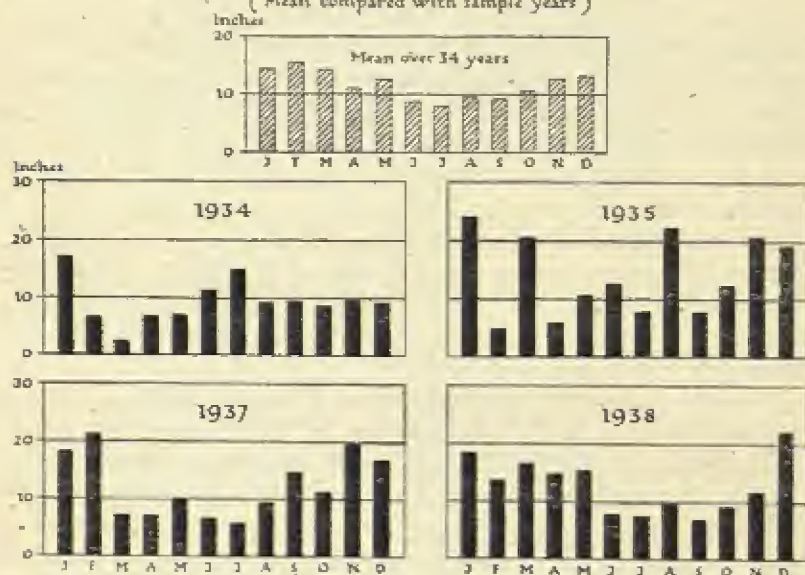


Fig. 85. Rotuma: monthly rainfall

Based on Colony of Fiji *Annual Meteorological Report* from 1934 to 1938 (Suva).

lowest in July, August and September. Extreme variation is between about 90° F. in January-March and about 68° F. in November. In any one month the extreme range is rarely more than about 18° F. and the variation between mean monthly maximum and minimum is usually only about 12°.

The average annual rainfall during 34 years' observations (Fig. 85) was 140 in. The heaviest monthly falls are from December to March (13-15 in.) and the lightest in the period between June and September (8-9 in.). Relative humidity is usually about 85 per cent.

Vegetation and Fauna

The soil on the lower slopes is rich black and fertile, and is cultivated in some cases even up to the lower ridges of the hills; the upper slopes of the hills are heavily wooded. Among the principal trees found on the island are the Tahitian chestnut, sago palm and coconut palm. Among cultivated plants are taro, yams, bananas, plantains, arrowroot and papaya. The only animals on the island are pigs, a few dogs and rats. Malaria-carrying mosquitoes occur.

HISTORY

Though surrounded on all sides by 200 miles or more of open sea, Rotuma was not completely isolated even in pre-European times. Native traditions record at least two important immigrations, in addition to other minor voyages. The first of these is believed to have occurred during the thirteenth century and to have brought to the island either Samoans or Tongans, who at first fought with the native inhabitants but later settled down peaceably beside them. The second, three centuries later, consisted of Tongans, about 300 in number, who came in large double canoes; for a time they attained ascendancy in the island, but they were eventually driven back and confined to the district of Noatau.

The earliest authenticated European visit to Rotuma is that of Captain Edwards in H.M.S. *Pandora* in 1791 during his search for the *Bounty* mutineers. The next caller was Captain Wilson in the mission ship *Duff* in 1797. During the following fifty years the island was visited by a number of exploring and surveying expeditions—notably those of Duperrey (who gave the first detailed description of the island) in 1822 and of Wilkes in 1840.

Shortly after 1820, British and American whalers began to call there to obtain water and supplies of fresh fruit and vegetables. Sometimes sailors deserted from these vessels. At one period there were reported to be as many as 70 residing on shore. Most were idle beachcombers, but some engaged in trade and acted as interpreters on visiting ships. In time they gave way to a better class of white men, who built up a considerable trade in coconut oil and later in copra.

Meanwhile many Rotumans had temporarily or permanently been away from the island. They formed part of the sandalwood-cutting and colonizing expedition which a Hawaiian chief took to the New Hebrides in 1829; they served as sailors on many trading

vessels and as divers in the Torres strait pearl fishery; and many went to Fiji to work on the cotton plantations. As in Niue, it finally became necessary to make regulations to restrict their wanderings.

Christianity was first brought to Rotuma in 1842 by Tongan native teachers of the Wesleyan mission. Members of the French Roman Catholic 'Société de Marie' (Marists) settled on the island four years later. They had at first little success, and in 1853 withdrew to Futuna with some of their adherents. Their return in 1868 precipitated a succession of wars between the Wesleyan and the Roman Catholic natives.

It was partly as a result of these exhausting conflicts that the chiefs made repeated requests to Great Britain to annex the island. After careful study of the situation the High Commissioner for the Western Pacific, Sir Arthur Gordon, concluded that such action was unavoidable. Rotuma was annexed in 1881. It was made a dependency of the Colony of Fiji.

PEOPLE

Population

The following table shows the population of Rotuma according to the 1936 census:

Ethnic group	Male	Female	Total
Rotumans	1,264	1,279	2,543
Other Polynesians	16	30	46
Fijians	43	11	54
Melanesians	4	0	4
Micronesians	3	1	4
Indians	12	7	19
Mixed-Bloods	28	22	50
Europeans	9	9	18
Others	2	0	2
Total	1,381	1,359	2,740

Based on: Colony of Fiji, *A Report on the 1936 Census*, pp. 20-1 (Suva, 1936).

The figures given for native Rotumans—estimates and census figures—have been fairly constant for about eighty years. They conceal, however, the considerable admixture of blood with Europeans and Asiatics which has taken place. Most of the inhabitants of one village, for instance, are descendants of one English resident.

No reliable figures for birth and death rates are available. The birth rate is said to vary from about 39 to 60 per thousand, and the

death rate from 28 to 61 per thousand. Infant mortality accounts for about half the deaths and is caused largely by unsatisfactory feeding.

About a dozen villages, with houses built in straggling lines, are scattered round the coast. There were altogether 360 houses in the island in 1928, giving an average of about 7.6 inhabitants per house.

Physical Type

The native Rotumans are of Polynesian stock. In skin colour they are brown—lighter than most other Polynesians, to whom they refer as 'black men', while they style themselves 'white men'. The men average 5 ft. 7 in. in height and the women 5 ft. 4 in. Physically they are well developed, but the women are inclined to stoutness. Their brows are well marked, their noses broad, their mouths large and prominent, and their hair wavy.

Language

The language of the people of Rotuma is Polynesian in its general character, with fairly close resemblance in vocabulary to Samoan and Tongan; it is also related to Fijian.

But it has a unique feature which is fundamental to its structure, and which superficially gives it a strange appearance to those acquainted with other Polynesian languages. Nearly every Rotuman word has two different forms or phases, a longer form or 'complete' phase, and a shorter form or 'incomplete' phase. The latter is derived from the former according to specific phonetic rules, the commonest being by dropping the final vowel, by modifying the preceding vowel after dropping the final one and by inverting the final syllable. Examples are:

<i>Complete Phase</i>	<i>Incomplete Phase</i>	<i>Meaning.</i>
<i>esu</i>	<i>es</i>	<i>papaya fruit</i>
<i>mose</i>	<i>mōs</i>	<i>sleep</i>
<i>mamosa</i>	<i>mamoas</i>	<i>ripe</i>

The uses of the two phases are not haphazard, but follow definite grammatical rules, mainly concerned with definiteness of meaning. Thus:

<i>esu mamoas</i>	=	<i>the papaya are ripe</i>
<i>es mamosa</i>	=	<i>the ripe papaya</i>
<i>vak lima</i>	=	<i>the five canoes</i>
<i>vakliam</i>	=	<i>five canoes</i>

The difference in meaning between the two forms is a major part of the structure of the language.

Culture

The native Rotuma culture is of Polynesian type. Formerly each house was built on a low raised platform of stone, filled with rubble or earth, and had a framework of stout wooden posts set about 4 ft. into the foundations. Oval in shape, it had a thatched roof of sago-palm leaves, sloping down all round from the ridge pole to meet the outer walls, which were of the same thatched construction as the roof. These houses are now replaced by buildings of European construction with iron roofs. The firm framework, low profile and close thatching enabled these houses to withstand high winds far better than the modern house does, with its reed or stone walls plastered with lime. Small sleeping houses built on piles close to the sea were formerly used by young men and boys to avoid mosquitoes.

Villages generally consist of a dozen or so houses built in line along the foreshore. The principal village of Motusa is built on the isthmus.

Social Organization. In pre-European times Rotuma was divided politically into seven independent units (*itu*), each ruled by a high chief (*pure ngangatchi*). These units, which have been termed states but which were too small to merit that title, were not all of the same order of importance. Noatau, at the eastern end of the island, was the leader, and its high chief on installation received a titular name, Marof; this custom did not obtain in the other political units. At one time there appears to have been a titular ruler of all Rotuma, the *Sau*, but the title later became a purely ceremonial one, with no political significance. It also became a dignity obtained periodically by election.

The people of each political unit comprised members of several large kinship groups or clans (*hoiasingi*, or *kauanga*), each of which was composed in its turn of a number of sub-groups or large 'families' of kinsfolk. Membership in such a group was counted through the male line, and the clans (or at least their sub-groups) were exogamous, a member of one having to marry a member of another.

Relations between a clan and its sub-groups have not been exactly defined, but it is clear that each clan had a chief (*pure*), occupied a village or a section of a village and held communal lands in which the clan-members individually had only a life interest. These lands, which were marked by trees or prominent rocks as boundaries, and

even by stone walls on the coast, included a stretch of beach and reef waters as well as territory inland; the reef edge was common property. The clan chiefs, together possibly with chiefs of sections of the village or of some of the clan sub-divisions, formed a village council, to assist the high chief by advice and to act to some extent as his executive officers.

Succession to chieftainship was by seniority, but the honours were transmitted in the first instance from one brother to another before the eldest son of the eldest brother could assume the position. This system of clans and rank is still largely in operation, and the old political units have now become modern administrative districts.

Formerly sanctions imposed for the enforcement of law were usually a fine of foodstuffs and a period of labour for the benefit of the community. In cases of adultery, however, no objection was raised if the offended husband clubbed his rival. Nowadays the same legal system obtains as in Fiji.

Food Production. On the higher slopes of the hills, the inhabitants plant taro, using flattened sticks or European spades. Yams are planted in the bush. After the crop has been raised, the bushland is burned and kava (*Piper methysticum*), tobacco, potatoes and sugar cane are planted in the soil thus enriched. Giant taro is grown in swamps as a reserve measure against famine, but is not in great favour.

In former times the numerous domestic pigs which roamed the villages and beaches were kept out of the plantations on the eastern part of the island by the so-called 'great wall of Rotuma', which consisted of a fence of lava stones, following approximately the course of the existing road. In 1928 there were estimated to be about 4,000 pigs in this enclosure. But the wall has since been broken up for the maintenance of village pig fences.

A great variety of fish are caught on the reefs and in the waters outside. A wooden hook is used for shark and a species of rock cod; pearl-shell hooks are used for smaller fish; and a specialized spinner of pearl shell with an animal-bone or turtle-bone barb is trolled behind the canoe for bonito. Cobwebs 'clumped' together take the garfish, whose jaws are too narrow for an ordinary hook, but whose long teeth become entangled in the web. Inside the reef the natives organize drives with nets to catch small fish.

Canoes. Two kinds of canoe were built in the latter part of the nineteenth century: the *tafunga*, ranging from about 25 to 35 ft. over all, and the *tavane*, about 12 ft. Both were dugout single-out-

rigger canoes with the outrigger float supported on two booms. The *tavane*, with very considerable tumblehome and an opening in the hull about 6 in. wide, was used only for paddling about the reef and is still in use for fishing. No sailing canoes are used, but the tradition of sailing remains and the word for a double canoe exists in the Rotuman vocabulary.

Warfare. War between districts was a quite frequent occurrence. Usually the occasion for the war was a disputed election for the ceremonial headship of the island. If a long-standing grievance had to be ventilated, a convenient excuse for a war could be found, as for example an insult to a neighbouring chief. Wars were conducted in a conventional way. A formal declaration of war was always made, and one district would even challenge another to meet it at a stated time in a definite place. Women were never molested. When peace was made, the victors would usually plunder the vanquished but would not burn their villages, nor did they annex territory. The men usually fought in line, young men in front with stones and other missiles and the veterans behind with clubs and spears. The clubs usually resembled those of Tonga or Fiji. Occasionally weapons with fitted sharks' teeth were used; they were probably introduced from the Gilbert islands.

Religion. Today about two-thirds of the Rotumans are Methodists and one-third are Roman Catholics.

Formerly the supreme deity worshipped in Rotuma was Tangaroa. He was said to be incarnate in a turtle. An aberrant form of totemism is to be found in the system whereby each kinship group had its own tutelary deity, usually associated with some reptile, fish or bird, such as the hammer-headed shark, sting-ray or lizard. A man would not harm a creature of the kind which represented the deity of his own group.

ADMINISTRATION AND SOCIAL SERVICES

Rotuma forms a dependency of the Colony of Fiji. It is administered as part of the Southern District of the colony, with headquarters at Suva. The District Commissioner is represented in Rotuma by a Resident Commissioner. He governs through the headmen of the seven districts into which the island is divided. Minor misdemeanours are dealt with by the Resident Commissioner, but serious criminal cases are tried in Fiji. Fijian laws and tariffs apply (Chapter V). No land may be leased from a native for a period of more than 21 years.

The health conditions of the people are fairly good, though about 20 per cent. of them develop conjunctivitis at an early age, and serious ocular complications are apt to ensue. Scabies is very common, but ringworm is rare. Tuberculosis is not prevalent. Filariasis affects about 30 per cent. of the population, but in most cases only slightly. Latrines are mostly of the cesspool type, though a few are arranged over the sea.

The Resident Commissioner is usually a qualified medical man, and acts also as Medical Officer. He has to assist him one native practitioner. There is a small but well-equipped hospital, which in 1928 had 20 beds.

ECONOMICS

No mineral deposits have been found on Rotuma. The soil is very fertile and agriculture is the main occupation. The principal export is copra, of which about 1,500 tons are usually exported annually, though in 1933 the export was over 2,000 tons. It has been estimated that only about one-third of the coconut production of the island goes to make copra, much of the remainder being used for drinking purposes and as food for pigs, but much also is allowed to rot on the ground. Several of the non-Rotuman 'native' inhabitants are employed in the copra industry by Rotumans, who are rich enough to pay them from 6s. to 10s. a day with food. Rotuma men are good seamen and hard workers, and are much in demand as labourers. The women are skilled in craftwork, and their very finely made native mats are much sought after.

COMMUNICATIONS

There is no port of entry at Rotuma, and all vessels proceeding there must first call at one of the ports in Fiji. A steamer visits the island from Fiji four times a year to land and take off cargo. A government-built unmetalled road about 18 miles long follows the coastline of the eastern part of the island, and there were, shortly before the war, about 30 motor cars and trucks. There is a W/T station east of Motusa bay.

UVEA (WALLIS ISLAND)

Uvea (lat. 13° 19' S, long. 176° 10' W), often called Wallis island, is a French protectorate. (It must not be confused with the island of the same name in the Loyalty group near New Caledonia, also a

PHYSICAL GEOGRAPHY

Uvea consists of one major island surrounded by a barrier reef, the whole being about 13 miles long by 10 miles in greatest width. On the barrier reef and within the enclosed lagoon are a number of islets—some mere jutting rocks, others large enough to support coconut plantations. The barrier reef completely surrounds the main island save for a few narrow passes and channels, of which that on the south side, Honikulu pass, is the most frequently used. The lagoon, ranging in width from less than 2 miles to about 5 miles, is shallow in most parts and studded with coral banks and patches. A fringing reef extends out from the shore of the main island, which has many beaches of muddy sand and shingle.

The main island, which has an area of 14,780 acres, is primarily of volcanic formation. The interior consists of a comparatively level plateau broken by a number of isolated hills, the highest of which, however, has an altitude of only 470 ft. above sea level. There are no traces of present-day volcanic activity, but in the south-west part of the island are five extinct crater pits, with sides falling away almost perpendicularly from the plateau surface. One of these craters, Lanumaha, is dry; the others contain water. There are also two shallow lakes near the eastern edge of the plateau; these possibly occupy ancient craters as well. The plateau ends in low, rather steep cliffs, at the foot of which is a narrow strip of lowland. This encircles the island, except in a few places where rocky points jut into the sea, and is apparently a raised fringing reef overlain by volcanic and coral debris. The shore consists largely of sandy beaches.

The most important of the islets are Faioa, very low and covered in coconut palms, on the south-east of the barrier reef, and Nukuatea, about 200 ft. high and rugged, in the south of the lagoon. None of the islets is permanently inhabited, but the natives visit them for fishing or for coconuts; they are also used by people recovering from illness, as they are reputed to be especially healthy. From the political point of view they are regarded as belonging to the respective districts and villages opposite which they lie.

Passes and Anchorages

The entry to the lagoon ordinarily used by vessels proceeding to anchorage is Honikulu pass, with a depth of 15 fathoms, on the south side of the barrier reef. This is winding, with a tidal current and strong eddies on the ebb tide. The pass leads by narrow and intricate

passages to an anchorage off Mua bay, on the south side of the island, in about 20 fathoms, with sand and coral bottom. But this anchorage is inconveniently far from the shore. A deep narrow channel, Faioa pass, leads from Honikulu pass to Matautu anchorage, on the east side of the island; about 2 miles northward of the anchorage the channel is completely obstructed by sandbanks. Matautu anchorage, though more convenient than that at Mua, gives poor protection against squalls from the east; depths are 10-15 fathoms. There is a pier at Matautu and easy landing for boats drawing not more than 3 ft.

Of the other passes only Fungaueva is practicable even for small vessels; it leads to a broad sheltered anchorage in 7-8 fathoms, but with many coral patches. Avatolu and Avapahu (not shown on the chart) are simply canoe channels through the reef.

Climate

Uvea, lying in the southern trade wind belt, has the usual climate of these latitudes—warm and humid but with two fairly well-marked seasons. From about May to October, during which period the trade winds blow regularly from the south-east, the climate is comparatively cool and dry. From about November to April—a period of more variable winds interspersed by calms—a hotter rainy season supervenes. In this latter season hurricanes from the north or north-east are liable to occur, though their frequency is on the average much less than one a year. Loss of life through a hurricane is rare, but the destruction of crops may create a threat of famine. After one notable hurricane, in 1889, the French Resident bought food on credit at the most accessible ports in order to relieve the food shortage.

The range of temperature throughout the year is small. For the cooler season the normal range has been given as between about 77 and 82° F. and for the hotter season as between 77 and 91° F. Extremes on occasion may be 75° F. and 93° F. Rainfall is more variable. Mean annual rainfall for two years, as recorded at the W/T station at Matautu, was just under 100 in., but its distribution is irregular; occasional heavy downpours in the wetter season may give as much rain in a day as may be given during a month in the drier season.

Surface water is scarce on the island. A few small streams rise at the base of the cliffs and meander across the narrow lowland strip to the sea. They are used for washing in, but their water is drunk

only when it is absolutely necessary. A few springs furnish drinking water, but the main source for the natives is the liquid of green coconuts. Europeans store rain water in tanks, and in recent years concrete cisterns have been built for native use. Kikila, one of the two shallow lakes near the eastern edge of the plateau, is a favourite bathing resort, and in former times the lakes on the western side seem to have been important for water supply, though difficult of access. Alofivai, the other eastern lake, is often dry, and the bottom of the crater then affords pasture for the cows of the nearby mission schools.

Vegetation and Fauna

Vegetation on the island is fairly abundant. On the lowland there is a variety of herbs, shrubs and trees, including a number of types introduced by the Polynesians, such as coconut, breadfruit and banana. The coconut extends for some distance inland, and near the north and the south ends of the island there are considerable groves, reaching from shore to shore. Much of the interior of the island is under cultivation, and yams, breadfruit, bananas, taro and sugar cane are grown there. Tall forest occurs chiefly in the south-central area, especially in the region of the crater lakes; this has an undergrowth of saplings, lianas and tree ferns, though not of a dense character. Near the centre of the island and on the slopes of mount Lulu is a fairly arid region, known to the natives as *toafa*. A small part of this is almost bare, supporting only a sparse growth of *Gleichenia* fern, while the remainder is covered by hibiscus and other low shrubs, with occasional trees of pandanus and casuarina. Polynesian arrowroot (*Tacca pinnatifida*) grows wild in this region, often abundantly, and serves as an important source of food in time of famine.

The wild land fauna, apart from fruit bats, consists mainly of birds, including pigeons, duck, swamp hens, rails and plover. There are also turtles and many kinds of fish, crustacea and molluscs. The domestic animals include pigs, cats, dogs, horses and poultry, and a few cows, goats and rabbits kept by the mission.

HISTORY

According to tradition, Uvea was colonized by Polynesians, possibly from Tonga, some four or five centuries ago. The history of the intervening period until the early nineteenth century is largely one

of struggles between rival chiefs, either as independent rulers over different regions or as contenders for the kingship which emerged at a fairly early stage. Contact with Tonga seems to have been maintained at fairly frequent intervals.

The European discovery of Uvea was by Captain Wallis in 1767. After this no European appears to have visited the island till 1825, when a vessel under an English captain entered the lagoon. Several vessels called soon afterwards, and ill-treatment of the natives by their crews provoked retaliation. In 1837 a mission party of French Marist priests called, and one of them, Father Bataillon, remained. After many difficulties, including intermittent hostilities between his converts and those of a Protestant mission from Tonga, Bataillon finally succeeded in obtaining the complete allegiance of the native king, who after baptism abandoned polygyny and was married by Catholic rites in 1846.

Bataillon was chiefly instrumental in bringing the island under the rule of France. In 1842, under his influence, the native king petitioned Louis-Philippe for the establishment of a protectorate. In 1844 Governor Bruat of Tahiti gave notice of the establishment of a protectorate, but meanwhile the French government had refused to do more than send a warship on an occasional visit to support the missionaries. From then onwards there was no formal connection of Uvea with France, though the French missionaries continued to exercise considerable political power. Eventually the island was added as a dependency to New Caledonia in 1887; in 1909 it was given an autonomous budget in conjunction with Futuna. In 1913 the island was declared to be annexed, but annexation has not yet been ratified by the metropolitan government. In 1932 the Privy Council of New Caledonia was endowed with the functions of an Administrative Council for Uvea and Futuna, with the right to be consulted on the budget, the customs tariff and loans.

European traders were established on the island about the middle of the nineteenth century, engaged mainly in the export of coconut oil and copra and the import of goods for sale to the natives. There has often been friction among the three agencies of European influence—the mission, the government and the traders; as between church and state the former has fairly consistently exercised more weight with the natives.

THE PEOPLE

Population Trend

Demographic data from Uvea are scanty, but it seems clear that the population has tended to maintain itself since the advent of Europeans. Father Bataillon estimated the total number of people on his arrival in 1837 as not more than 3,000. At intervals since then the missionaries have compiled figures as follows:

1880	3,824	1904	4,536
1883	4,100	1913	4,100
1885	3,946	1917	4,239
1897	4,187	1919	4,386
1900	4,300	1923	4,878

Based on: Edwin G. Burrows, 'Ethnology of Uvea (Wallis Island)', *Bernice P. Bishop Museum Bulletin*, no. 145, p. 15 (Honolulu, 1937).

According to the government census in 1936 the total population was 4,272, and more recent estimates have given a figure of about 4,500. Granted that the figure of 3,000 a century ago was not greatly under-estimated, a major increase of population must have taken place in the fifty years after the establishment of European influence, after which period a rough position of equilibrium has been maintained. It is possible that the periodic rise and fall indicated by the figures has been due to introduced epidemic diseases; in 1932, for instance, at least 72 people died in an epidemic of amœbic dysentery, and it is estimated that in all somewhat more than 3 per cent. of the population were lost. Since a large proportion of these were under 15 years of age, the effect on subsequent fertility may have been considerable. In recent years, however, increased medical services have probably tended to reduce general mortality, and in particular maternal mortality and infant mortality. Cases of umbilical tetanus in rural areas, for instance, fell from 14 in 1935 to 2 in 1937.

The population is almost wholly native Polynesian; Europeans (all French) and Asiatics probably number less than a dozen.

Physical Type

The people of Uvea conform to the general Polynesian type, being tall, robust and well proportioned, with light brown or coppery yellow skin and dark, straight or slightly wavy hair, which is, however, usually bleached with lime to a reddish or even golden tint. The skull form resembles that of other western Polynesian peoples in being comparatively broad and rounded; in some cases the back of the skull is flattened by deformation in infancy. The face is oval and

the nose straight; the cheekbones are slightly prominent. Prognathism does not exist. Body hair is little developed, and few men wear a full beard.

Language

The language of the people, a dialect of Polynesian, is closely allied with that of Tonga and rather less closely with that of Samoa. Its most marked phonetic difference from Samoan is the comparative rarity of the *s* sound, which is represented commonly in Uvean by *h*, as in Tongan. In some words *s* may have become *h* in fairly recent times; thus the indefinite article *he* appears in an old song as *se*, which is the form used in Samoan. On the other hand, *s* is used in a number of words in which Tongan uses a sibilant (palatalized) *t*. (This latter sound was written in Tongan until recently as *j*, but has now been replaced by *s*.) The glottal stop is used very frequently in Uvean, as in Samoan and Tongan, and words of otherwise identical spelling may have very different meanings according to whether it is present or absent. Thus whereas *ala* means a road or way, '*ala* means to awake; the verb *hau* means to govern, while the verb *ha'u* means to come. But in Uvean the glottal stop seems to have come to be inserted rather capriciously in some cases, where the comparable words in other Polynesian dialects do not have it; for instance, it may have the effect of splitting a long vowel, as in *Ha'amoa*, the Uvean equivalent of Samoa.

Culture

Although the people of Uvea have been subjected for just over a century to European influence, this has affected their way of life mainly in politics and religion and in the introduction of a money economy; much of their traditional culture has persisted in other spheres.

The houses are built on a wooden framework, with roofs of palm thatch and light walls of palings, plaited screens or reed lattice. The floors are of earth, covered with coarse mats of coconut leaves, and about half the dwellings stand on platforms of earth faced with coral slabs. Being thus 2 or 3 ft. above the surrounding land, they secure better drainage.

In olden days there were many dwellings in the interior of the island, partly for defence from invaders and partly to utilize the fresh water supply of the crater lakes. Nowadays all the villages in permanent habitation lie beside the sea; the shore sites have become

safe as governmental authority has spread and warfare been abandoned. Settlement is concentrated almost wholly on the east and south-east coasts, probably because of the cooler weather and the existence of the three churches there. Such people as live on the west (leeward) side come over at week-ends to church, and one village is maintained as a week-end residence for them.

The principal village is Matautu, where the Resident lives. There is an important mission station at Mua and a mission seminary at Lano.

Social Organization. The basis of the native social organization lies in a set of kinship groups in which descent is traced from a common ancestor, usually in the male line. The functions of these groups, each of which formerly had a distinguishing name, are primarily in controlling land, and in the co-operation of their members for social events such as the feasts which signalize births, marriages and funerals. Each kinship group is composed of a number of households of varying size, with from three to twelve members as a rule, and each household has a 'family' name by which it is commonly known. When such a household becomes very large it tends to split off from the parent kinship group, taking with it a portion of the common land, and henceforth it acts in social and economic affairs as an independent unit. A number of the large kinship groups have special status because their senior members possess hereditary chiefly titles.

The ancient native system of rank is still largely operative. The person of most importance in the Uvea community is the king, who is supreme in native affairs for all practical purposes; he bears the title of Lavelua. After him in rank come six ministers, in a definite order of precedence; in former times next to them came the leader in war. All these men are high chiefs. The village chiefs, of whom there are nineteen in all, form a lower grade. They also hold hereditary titles and have a fixed order of rank within each district in which their villages lie. But the relative rank of some of the chiefs and ministers has changed in the course of the traditional history of the island. Normally the eldest son succeeds his father in a title, but in some cases there are several candidates, and the particular kinship group concerned always makes the actual nomination, which is then either confirmed by the king and his ministers, or rejected with a request for another nomination.

Kingship in Uvea is an ancient institution, but traditions of the period prior to about the beginning of the seventeenth century

suggest that at this time there were several rival independent chiefs in the island, with no united rule. In this early period, also, invasion and temporary rule by Tongans tended to disturb the political continuity.

The social institutions of the Uvea people are of a type common in western Polynesia. Incision of adolescent boys (a practice analogous to circumcision) is general, and tattooing of men on chest and arms is still common, though no longer with native designs. Specific kinship usages include some degree of avoidance between brother and sister, who may not sleep in the same house when grown up, and should not joke with each other but should treat each other with respect. In western Polynesia as a whole it is common for people to have great freedom with the property of their mother's brothers; this custom obtains in Uvea, but the practice of it is restricted to only one group, related to the king through a former king's daughter. People of this group have the right of taking food laid before the king for distribution at a feast. A custom in Uvea which is uncommon elsewhere in Polynesia is that whereby each village has a dormitory in which boys and unmarried youths sleep; the girls sleep at home. Again, while marriage is celebrated with a feast and distribution of presents, as is general in Polynesia, nearly all weddings take place together at the one time of year; this anomalous custom is the result of mission influence.

Land Tenure and Property. The system of land tenure still follows in all essentials the native custom. The French government, the mission and the traders own small tracts of land—in the case of government and mission obtained by grant or gift from the natives; in the case of traders by purchase or equivalent arrangement. All other land is owned by the natives. There are three categories of such land—public land, village land and land owned by separate kinship groups. The last is by far the largest category. Public land is mostly confined to the uncultivated arid central region of the island and the forest area about the crater lakes. Anyone may gather wood and other supplies there. An extension of public privilege applies to the coconut palms of the interior; any thirsty wayfarer may pluck nuts to drink, though he is forbidden to carry any away. Village land is found where the shore strip is wide and patches of irrigated taro land have been developed. Plots of this are allotted by the village council among the households and changed from time to time. The ditches are dug by village labour, and first-fruits of all crops are presented to the village chief. The common dormitory in

which all young men sleep is also village property. All the rest of the land belongs to separate kinship groups. Their holdings are fairly well localized by districts and villages, but changes of residence, intermarriage, and splitting up of these kinship groups have created a complex pattern of plantations, so that not all the land of any single group forms a contiguous area. When disputes arise over the ownership of any particular tract, settlement is made on the basis of the genealogies which record the descent and kinship of the parties. The former Queen Amélie (who died in 1895) was noted for her skill in settling disputes by her genealogical knowledge. All the land of the kinship group belongs in common to its members, but in practice it is worked by individuals, with the senior man of the group as general administrator. In addition every person has a subsidiary claim to the use of land belonging to his mother's group, though this is to be drawn upon normally only in case of need.

Food Production. The occupations of the people of Uvea are primarily agriculture and fishing. Agriculture falls into two classes: wet-land cultivation, practised only for taro; and dry-land cultivation, used for all crops grown in the plantations of the interior, including bananas and some taro, but especially yams. Digging sticks with points hardened in the fire were formerly the only type of implement used in cultivation, but tools of European style have now been introduced. In the wet-land cultivation of taro the soil irrigated by the streams or seepage from the cliff is used, ditches being dug for drainage. A mulch of coconut leaves or old mats is used to prevent too rapid evaporation round the plants. For dry-land cultivation in the interior no mulch is used. A rough rotation of soil is practised, plots being allowed to stand vacant fifteen to twenty years after two or three harvests. Oranges, sweet potatoes and a few other introduced plants are also cultivated, but they play no important part in the native economy. When the yams are too small to be dug and no breadfruit is ripe the main supplies of vegetable food are given by coconuts and bananas. In some years, especially after a hurricane, there is distinct food shortage. Then the people burn off the brushwood in the interior of the island; wild yams and wild arrowroot are said to be the first plants to sprout after the fire, and so are easily found and used for food. Pigs, fowls and dogs are kept, but the two former are rarely eaten except at feasts. Horses are also kept and used for riding or as pack animals, and there are now some cattle.

The varied fishing grounds around Uvea—fringing reef, lagoon,

barrier reef and open sea—offer great quantity and variety of sea food, and many types of fishing are in vogue. Netting and angling are not common, but spearing is a favourite method with men, and fishing at coconut leaf weirs is part of the daily routine of the women. Fish-poisoning with a fruit of a species of *Barringtonia* is a co-operative task, but restricted to men; women are forbidden to participate. Canoes are of two types—simple dugout (without outrigger) and canoes with single outrigger. The larger outrigger canoes have composite hulls in which the sections are joined by lashings of coconut husk cordage (sennit). Some of these canoes are fitted with mast and sail, the latter nowadays being of canvas. In former times double canoes were also used for long voyages, and had a capacity of 100 people or more; they were abandoned about the beginning of the present century.

Religion. The ancient religion of Uvea has completely disappeared, and little information about it is now available. But the worship of gods (including Tangaloa, the creator) who could become manifest in birds and animals; the belief that ancestral spirits could appear in the bodies of human mediums; the use of large buildings as temples; the annual religious festival with offerings and supplication to the gods; and the ritual use of kava—all indicate the existence of cults of a western Polynesian type, the modern analogies to which are found only in Tikopia (pp. 695-7) and Rennell island.

The people of Uvea are all Roman Catholic, and the influence of the mission has been considerable in restraining warfare, abolishing polygyny, modifying the form of female dress, introducing the Gregorian calendar, and making the week an important division of time in native life, with Sunday as a day of rest.

ADMINISTRATION AND SOCIAL SERVICES

The general administration of Uvea is in the hands of a French Resident, who also is in charge of Futuna. He is customarily a member of the French colonial medical service.

The Resident is a magistrate, controls major political affairs, and in recent years has played a prominent part in the social and economic development of the community. Before 1933 he exercised his functions as a magistrate only in regard to French citizens, but by a decree in that year the system of justice was reorganized, a tribunal was created with its seat at Matautu, and the Resident was given extended jurisdiction for both Uvea and Futuna, to act in all matters

affecting French citizens, foreigners and the relations of natives with them. Only those matters where natives alone were concerned remained under native jurisdiction. In matters where one of the parties is a native, the Resident as magistrate is assisted by a native assessor, who is nominated by the king, with agreement by the Resident.

Local government is largely in the hands of the king, chiefs and councils, and still depends to a great extent upon traditional principles. The most important administrative body is the king's council, consisting of the king and his ministers, who hold regular monthly meetings. The council decides on general policy for the kingdom as a whole—in relation to the French authorities, as in matters of taxation and public works; and in arrangements for community festivities. Members are seated in order of rank, and the meeting commonly begins with formal serving of kava.

The island is subdivided for purposes of local government into three districts: Mua, in the south; Hahake, in the centre; and Hihifo, in the north. These were instituted by the native Queen Amélie in 1870, on the advice of the mission; and each has a district governor of royal blood and a district council. But these governors have no chiefly titles, and the presidency of each district council is undertaken by one of the king's ministers, who have such titles. The other members of the district council are the village chief of the district and the district governor. The original institution was intended to provide tribunals on a European model, but it has reverted to the ancient form of the native council. The district governor is thus not now the controlling authority but really an executive officer who carries out the orders of the king and his council.

The village councils consist of the village chief, who presides, and all adult males of the village. Each village has also an executive officer with duties akin to those of a policeman.

Until about a decade ago the general standard of living of the people of Uvea was low. Through conservatism and suspicion of the authorities they resisted attempts to raise it, and moreover the funds available to the authorities were small.

Since 1934 social services have been radically improved with the aid of credits put at the disposal of the group by the French High Commissioner. Between 1935 and 1938 a stone hospital with maternity and other provision was erected at Matautu and a small farm was instituted for the supply of milk, eggs, etc.; education in

hygiene and maternal welfare was begun, and dispensaries were opened in two outlying districts. Large concrete cisterns, each holding 50,000 gallons of water, were built in the villages, there being ten such in 1939, with more planned. Education, furnished at a primary grade by the missions, was extended by the provision of a supplementary school of a higher grade with the aims of spreading knowledge of French and of securing native recruits for social and other work. Up to 1939 five pupils from this school, gifted sons of chiefs, had been sent to a technical school in New Caledonia for further training in agriculture and craftsmanship.

The revenue of the island is derived partly from import duties and partly from a poll tax; in 1932 the latter was 50 francs per annum for each adult male. But expenditure has exceeded revenue for many years, and a small subsidy from the French government has balanced the budget. Apart from supplementing the administrative funds, the French government for some years subsidized the visits of a vessel of the Messageries Maritimes, calling three times a year at Uvea and the Hoorn islands.

ECONOMICS

For the most part the people of Uvea practise a subsistence economy. But an important source of money income to them is copra, which they sell to the resident traders, using the proceeds to buy cloth and other goods and to pay taxes. In the late nineteenth century the average production of copra was 300-350 tons per annum, rising more recently to about 1,000 tons per annum; the highest figure reached was stated to have been 1,200 tons. Local prices have often been exceedingly low—during the depression of 1932 as little as £1 per ton was paid for copra delivered at the trader's store. But in the last few years the economic development of the island has been taken in hand, and improvements have been made. Production of copra from Uvea and the Hoorn islands together rose from 1,120 tons in 1934 (after a cyclone) to 1,934 tons in 1935 and was 1,508 tons in 1937, as the result of compulsory weeding of plantations, regular destruction of larvæ of the rhinoceros beetle and stimulation of production by monthly meetings of a planning society (*société de prévoyance*) established in 1934.

To remedy to some extent the difficulties of reliance on a single export crop an attempt has been made to diversify agricultural production in Uvea and the Hoorn islands. The castor oil plant,

easy to cultivate and of rapid yield, was introduced, and production of the seeds from the two territories was 9 tons in 1934, 20 tons in 1935, and 18 tons in 1936. With the aid of bounties on copra paid by France and administered by the *société de prévoyance*, two machines for hulling castor oil seeds were bought; several thousand agricultural tools were distributed free, as well as maize and Angola pea seeds; and in 1934 25 cattle were imported, these increasing by 1936 to 51 head. The results of the new economic programme have thus been encouraging, and from the budgetary point of view have been successful in that receipts have increased and the local reserve is in a favourable condition.

For many years the trade of Uvea was largely in the hands of Burns, Philp and Company, operating from Sydney, Fiji and Samoa. The currency used was British. The shilling was the common coin. By 1933, however, largely as the result of subsidized French shipping services, French money was beginning to circulate. In the same year the metric system was made obligatory. Since then the trade has been largely regained by the British firm.

COMMUNICATIONS

Uvea has no air communications, and communication by sea is infrequent. In 1931 a steamer service, subsidized by the French government, began from New Caledonia, in competition with the sailing vessels of Burns, Philp and Company, which linked the island with Fiji and Samoa. By 1935 the French service, calling three times a year, had apparently become the main if not the only medium of sea transport. But more recently the Australian firm appears again to be providing the service.

A sanded road of firm surface, 16 ft. broad, runs for 15 miles along the eastern side of the island, connecting the principal settlements. It keeps to the interior plateau except for a short stretch near Lano, where it descends to the lowland near the shore. Light bridges consisting of a few logs resting on abutments of stone and earth cross the small streams. An old native road lies closer to the sea. Beaten tracks cross the island, and nearly every village has several to connect it with the plantations in the interior. A motor truck was introduced in 1928, and several motor cars in 1937, but horses are mainly used for riding and transport of goods, and much communication is still on foot.

There is a W/T station, opened in 1938, at Matautu, and a post office.

FUTUNA (HOORN ISLANDS)

Futuna and its small neighbour Alofi, together known as the Hoorn islands, lie between lat. $14^{\circ} 11'$ and $14^{\circ} 21' S$, long. $177^{\circ} 55'$ and $178^{\circ} 10' W$, about 150 miles north-east of Vanua Levu, Fiji, and 100 miles south-west of Uvea (Wallis island) (Fig. 87). Together with Uvea they are a French dependency, administered ultimately from Noumea. The Hoorn islands are sometimes incorrectly named the Horne, or Horn, islands. They are also commonly referred to as

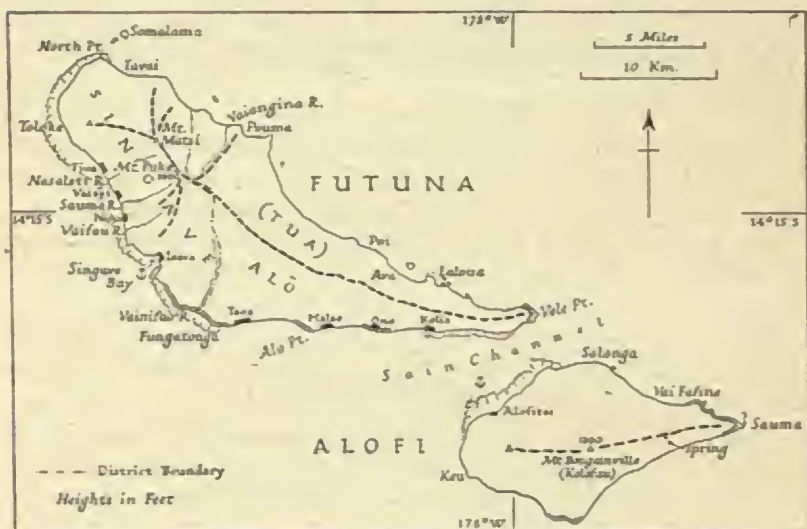


Fig. 87. Futuna and Alofi (Hoorn islands)

Names of districts of Futuna are given in large capitals, and the boundaries are marked by broken lines. Based on: (1) Admiralty chart no. 987; (2) E. G. Burrows, *Bernice P. Bishop Bulletin*, no. 138, p. 6 (Honolulu, 1936).

Futuna, from the name of the main island of the group (not to be confused with Futuna, also known as Erronan, in the New Hebrides).

PHYSICAL GEOGRAPHY

The group consists of two islands, Futuna and Alofi, which are separated by Sain channel. Both islands are of volcanic formation, and are much higher than Uvea. Each is surrounded by a fringing reef, except at a few places where the land shelves off steeply into the sea, and at Singave bay on Futuna, where there is an opening in

the reef opposite the mouth of a stream. On the southerly shores of Futuna and the northerly shores of Alofi the reef reaches a width of up to $\frac{1}{2}$ mile; elsewhere it rarely exceeds 50 yd. in width. The group has no barrier reef, and in contrast to the calm lagoon waters of Uvea the swell of the open sea breaks in surf on the shores of the islands or on the nearby reef edge. The only anchorage off Futuna is in Singave bay, on the south-west side, a deep submarine valley between reefs. This is about 600 yd. wide, with anchorage on a sandy bottom in 33 fathoms, and is comparatively sheltered. Landing is available for boats at a concrete wharf. There is also sheltered anchorage from the prevailing south-east trade winds off Alofitai (Mua) in Sain channel, in 19 fathoms. The middle of Sain channel is clear and deep.

Futuna is $8\frac{1}{2}$ miles long and 5 miles broad at its widest and has an area of 15,775 acres. A strip of lowland, apparently an old raised reef, forms a belt around the island, except where a few rocky ridges come down to the sea on the north-west and south-east sides. To landward of this low belt runs a cliff, presumably an old shore line. On the north-east side the steep grade of the cliff continues well up into the mountains, but on the south side it levels off on to a plateau which occupies much of the interior. This plateau slopes upwards to the mountains and is cut by narrow stream valleys into a series of flats covered with red soil, nearly as dense as rock, from which rain water runs off rapidly. The main ridge of mountains that runs the length of the island reaches a maximum height of about 2,500 ft. in mount Schouten (mount Puke) in the north-east, with a somewhat lower peak in Matsi a little further north-west again.

Alofi is about 6 miles long, east and west, and 3 miles broad at the widest part; it has an area of about 7,300 acres. As on Futuna, a strip of old raised reef forms the shore belt, with a similar rocky cliff rising inland to a plateau. But on Alofi this plateau is rather higher at the sides than in the centre; and the interior of the island, being thus roughly bowl-shaped, tends to conserve rainfall. The main ridge runs south of the major axis of the island and has its highest point in mount Bougainville (Kolofau), about 1,200 ft. above sea level.

The volcanic character of the Hoorn islands is indicated by the presence of at least one hot spring on each. That at Tavai on Futuna is uncovered only at low tide; that at Keu on Alofi is close to the shore. Earthquakes are fairly frequent on both islands; some of them are violent, but no damage is said to have resulted. In wet weather steam issues from some rocks on Alofi.

On Futuna the drainage from the mountains and the plateau is carried off by more than half a dozen streams which debouch from steep valleys upon the flat shore belt. On Alofi the central depression inhibits stream formation, though there are springs of fresh water at the base of the cliffs.

Climate

The climate of the islands is very similar to that of Uvea, but there is probably rather more rain.

Vegetation

The types of plants on Futuna and Alofi are very similar to those of Uvea. On Futuna, however, there is rather more tendency to a zoned distribution. On the flat shore belt are plantations of coconut, breadfruit, banana, arrowroot and other cultivated plants, with irrigated wet-land taro patches wherever there is a broad valley mouth at the base of a gorge. On some of the lower cliff slopes there are plantations of dry-land taro, yams and other crops, in a soil enriched by vegetable mould and supplied with water by seepage. On the plateau, in the red soil of the flats, is a scanty vegetation of stunted *Gleichenia* fern, with a few casuarina and pandanus trees; the steep-sided valleys here are densely wooded. Neither flats nor valleys are used for cultivation. This arid region, like that of Uvea, is known as the *toafa*. The mountain tops are mostly covered in forest, and in pockets between them are a few taro plantations, the crop from which is reserved for great feasts. The most conspicuous difference between the forest of Futuna and that of Uvea is that the former is richer in tree ferns.

Alofi differs from Futuna in having no irrigated taro, owing to the lack of streams, and in having very much less of the arid *toafa*, owing to the better conservation of rainfall on the interior plateau. Here the vegetation, in contrast to that of Futuna, is mainly tall forest, with many large trees, which provide the people of Futuna with timber for their canoes.

HISTORY

It is impossible to reconstruct with any certainty the early history of Futuna and Alofi. According to one tradition the first settlers in Tua came from Samoa, but the origin of those in the other districts cannot be established. There is definite evidence, however, of early contact with Tonga, mainly in the form of Tongan invasions, which

for the most part were repelled. One of the best-known traditions is the story of the arrival of a 'Chinese' vessel, the crew of which left numerous descendants; it is possible that this was actually from the Marshall islands. As far as Europeans were concerned, Futuna and Alofi were discovered by Le Maire and Schouten in 1616 and named the Hoorn islands. The next European visitor was Bougainville in 1768. During the first half of the nineteenth century whalers called for provisions and women. Some of the Futuna men served aboard these whaling vessels, and a number of sailors deserted from their ships to live on shore. The first missionary to settle in the group was the Marist Father Chanel in 1837. Four years later he was killed at the instance of the native king, who saw in the attempted conversion of the people an attack on the political system and on his own authority, both of which were closely dependent on the ancestral religion. Shortly after Chanel's death many of the people accepted Christianity, largely as a result of the zealous work of a native catechist; the conversion of the whole island soon followed. In 1842 the chiefs asked for a French protectorate. The subsequent political history of the group has followed the same course as that of Uvea.

THE PEOPLE

Population Trend

Early estimates of the population of Futuna and Alofi place it at several thousand, but it is possible that these judgments are an exaggeration. It does seem, however, that there was some diminution in numbers between the time of the first European arrivals and the conversion of the people to Christianity. Alofi, formerly inhabited, appears to have been deserted about 1800, largely as the result of conquest by the people of Futuna. Driven by a famine which resulted from a hurricane, they killed and ate many of the Alofi people. From that time onwards Alofi has had no permanent settlement, but is used for cultivation by the people of Futuna.

Figures for the population of Futuna at various dates as compiled by the missionaries are as follows:

1842	840	1898	1,491	1919	1,497
1844	1,140	1904	1,550	1923	1,524
1880	1,360	1913	1,396	1931	1,726
1896	1,535	1917	1,365		

An exact census of the people in more recent years is not available, but the population in 1936 was about 1,800, of whom practically all were natives. The figures indicate a general trend of moderate

increase during the last century; the occasional lapses seem to have been due to epidemics of introduced disease. As on Uvea, a dysentery epidemic in 1932 was responsible for the death of some 3 per cent. of the people. No statistics of birth-rates are available; the only record of sex distribution is two villages in 1932, where there were 240 males and 237 females.

Physical Type and Language

In physical type and language the people of Futuna are very similar to those of Uvea (pp. 282, 283). The main phonetic differences between the dialects of Futuna and Uvea are that the former uses *s* or *f* where the latter uses *h*, and in some words uses *l* where the latter uses *t*. There are also some differences in vocabulary. Owing to the fact that until recently most of the trade of Futuna was in British hands, some words of English origin have become incorporated in the native language; and, though French has been taught in the mission schools, there were for a long time more Futunans who spoke a little English than there were those who spoke French. It is probable, however, that a knowledge of French has now become more widespread.

Culture

Like the people of Uvea, those of Futuna have been influenced in their economic and social life by Europeans, particularly by the missionaries, but have retained many of their old Polynesian institutions.

The houses consist of thatched roofs on wooden framework, but in contrast to those on Uvea are not built on raised platforms and lack side walls. The place of these latter is taken by low fences of logs laid between the house posts, to keep out pigs, with palm-leaf screens above, which are folded out of the way except when needed to stop the entry of wind and rain. The floor of the house and ground round about is strewn with gravel of water-worn coral and is not permanently covered with mats, as is the floor of an Uvean house.

All the Futuna villages which are continuously inhabited are on the southern (windward) side, possibly due to the cooler situation. Permanent dwellings are on the flat shore belt, mostly within 50 yd. or so of the sea, but inland there are some temporary shelters to accommodate workers in the plantations. In olden days inland hill sites were in continuous occupation, probably as a means of defence against invaders; but they were abandoned as political units became

larger and the danger of surprise attacks from neighbouring settlements decreased. When Alôfi had its own inhabitants they lived in the interior as well as along the shore, since the distance from the sea is nowhere great, and the only land that will grow taro or yams is above the cliffs. On Futuna a wall of coral rock or coconut logs runs completely round the island, except in a few places where the cliffs reach the sea, to prevent pigs from escaping from the shore belt up into the undergrowth.

The mission has affected settlement to some extent—tending to concentrate the population near the churches and so depopulating the outlying districts. Even workers in outlying plantations, such as those on Alofi and in Tua (the northern area of Futuna), return to the main villages every week-end, leaving these regions uninhabited.

Social Organization. The basic social and economic organization of the people of Futuna is similar in many respects to that of the people of Uvea. The community is divided into a number of large 'families', which are groups of kinsfolk each with a distinguishing name or title. The members of each are linked by common descent primarily in the male line, though kinship through the female line may also be admitted. From a local point of view these kinship groups are organized into districts, of which until about 1800 there were a number, independent of one another. Conquest, however, finally reduced them to two—Tua on the east and north of Futuna, and Singave on the west. In the early part of the nineteenth century warfare between them was frequent, the last battle being fought in 1839. The king of Tua then took up residence in Alo, on the south side of the island, and this then replaced Tua as the district name. Alofi, conquered by the people of Tua, is reckoned as part of Alo district.

Each district has a king, under whom are several chiefs and sub-chiefs, but as in Uvea rank has not been elaborated to the extent which it has in Samoa and Tonga. Succession to kingship, or to chieftainship, is patrilineal but is not necessarily from father to son. Selection of the king of Singave is made by the district council, since there are two rival families from whom the heir may be chosen. Respect is shown by commoners to all chiefs by removal of the bark-cloth turban (the normal head-dress for men) in their presence, and certain further marks of respect are given to a king; for instance, when he enters any village except that where he ordinarily resides a feast must be given in his honour. Formal recognition of rank is shown most clearly in the order of serving kava on public occasions.

Each king, as also sometimes a village chief, appoints one or two adjutants, whose functions are purely ceremonial, at the formal kava drinking. Apart from chieftainship, there are other titles inherited within kinship groups, as those of master-builder and of turnerik-expert.

The system of land tenure rests primarily on the kinship organization. Each separate group has under its joint ownership one or more strips of land running in from the sea for about $\frac{1}{2}$ mile to the upland wilderness and including dwelling sites, taro patches and other plantations. These strips are demarcated by boundaries of fences, walls, or crosses cut in coconut palms. The principal manager of the group property is normally the man of senior descent in the group; but all members (including women) have a lifelong right to a share in the use of the lands. The role of the manager is mainly restricted to allotting land to individuals of the group, but even in this he must have the consent of the other members. He cannot dispose of the land to persons outside the kinship group without the consent of the group as a whole.

This pattern of land ownership is complicated to some extent by historical rights resting upon conquest. The kinship groups in the Alo district, on the south side of Futuna, own land there, but in addition have holdings in the Tua district on the north side, the home of their ancestors, and also in Alofi, which their ancestors conquered. There is also a certain amount of landed property held by larger social units; a few taro patches high among the mountains lie in sites chosen by villages and are regarded as village property so long as they are under cultivation; and the uncultivated land in the interior of Futuna is regarded as the property of the district in which it lies, anyone of the district being free to hunt, cut wood or collect wild fruits there.

Social institutions of Futuna are almost identical with those of Uvea. But certain small differences exist. Whereas the girls of Uvea sleep at home, those of Futuna usually sleep in a convent or other mission building. And the right of certain kinsfolk of the king to take food at feasts over which he presides, a privilege deriving from their descent from a former king's sister, is more widely spread in Futuna. In religion the people are all Roman Catholic. Their ancient religion was of the same type as that of Uvea.

Food Production. Like the people of Uvea, those of Futuna rely mainly on agriculture and fishing for food. But the population density is only about one-third of that of Uvea, and the people of

Futuna are better provided with vegetable foods, although the coconut groves are less extensive. Famine is rarer, and there is no record of the Futuna people having to burn off brushwood in search of wild arrowroot and wild yams. Breadfruit is of much the same importance, but bananas form a less important part of the food supply because of the proportionately larger amount of taro grown. Taro cultivation is facilitated by the many streams, and irrigation of fields is arranged by rock dams across stream valleys and by small built-up canals which run through a system of terraces. The amount of the irrigated ground varies according to topography; it is the most valued of all arable land. In villages not favoured with a large valley for irrigation, yams become more important. They are grown on dry ground, mainly on exposed slopes or ridges. When the land is being cleared the trees are not merely girdled to kill them, as in Uvea, but are cut down. And instead of being trained on conical frames of poles, the vines are allowed to trail along the ground, a method which (according to the natives) protects them from high winds. Plants and animals have been introduced by the mission but are not widely used; the most favoured introduced plant is the orange. The papaya is common, but the fruit is mostly fed to pigs and the leaves used as fodder for horses. Manioc, apparently introduced by the mission, is occasionally grown, but the starch is used as a paste in making bark cloth and does not seem to be used as food. The native domesticated animals, however—the pig, dog and fowl—are all mixed with European strains.

In fishing the people of Futuna are less advantageously situated than those of Uvea. On the whole fishing is a less important industry than in most Polynesian islands. The taking of fish for daily use is left to the women, and the usual method—with a triangular scoop net held in one hand—is different from that employed in Uvea. (It is similar, however, to that used in Tikopia and some other Polynesian islands.) Most of the fish taken are only 2 or 3 in. long, and they are used as relish with vegetable dishes rather than as a separate dish by themselves. Outrigger canoes are still made and used, but they play little part in fishing and are employed mainly in ferrying workers across the channel between Futuna and Alofi to visit plantations on the latter island.

ADMINISTRATION AND SOCIAL SERVICES

The general administration of the group is in the hands of the French Resident on Uvea, who visits Futuna several times a year. The head of the Roman Catholic mission at Singave acts as Deputy Resident. Local administration follows the lines of the native organization, the governmental units being the villages and the two districts, Singave and Alo. Each district, independent under the French central authority, is governed by its king and a council of chiefs. The kings and chiefs are paid small sums by the government. Each village is governed by its chief and council of male householders; in addition, it has a council of women.

The district council meets every Sunday and deals with church business and district festivals as well as government affairs, such as means of paying taxes, repair of roads and walls, and the punishment of serious offences by fines in goods or forced labour. The village council meets every Saturday and is a replica for immediate local needs of the district council; it also functions as a court of first instance. Each village has one or two policemen.

The system of taxation includes a licence fee and import and export taxes falling on the local traders, and a poll tax on each adult male native. This is paid in quarterly instalments and in 1932 amounted to 12s. per head, nearly half the average individual money income. There was also a district tax, formerly collected in money, but changed in 1930 to a labour tax at the request of the natives. In 1931 each village contributed labour on the road round the island, and in 1932 Singave villagers worked on a concrete wharf at Leava. A small income for the administration is derived from stamps on outgoing mail.

Social services on Futuna are not extensive. Education of a primary grade is provided by the mission, with schools for boys and for girls; and about 1927 the government established a dispensary in Singave on land given by the natives, with medical treatment provided by a sister of the mission who was a trained nurse. In 1939 a second dispensary at Alo was planned. The hospital on Uvea serves the most serious cases of sickness.

ECONOMICS

Money is provided mainly by the preparation of copra, production of which on the average has been about 500 or 600 tons per annum. The price of copra has often been very low—in 1932 in the

depression period it was only 15s. per ton. Individual income from it has tended to be, on the average, £2 to £3 a year. For men living near the anchorage this has been supplemented by wages obtained by helping to load and unload ships, or by assisting a trader in preparing copra for export.

Imports comprise mainly steel tools, cotton cloth, bead ornaments, soap, matches, kerosine and European perfumes. Tobacco is imported, but the natives prefer their own locally grown leaf. Rice, corned beef and ship's biscuits are liked, but for lack of money are rarely had except when issued by a trader as part payment for labour.

Some details of the recent economic development of Futuna have been included with the material on Uvea (pp. 289-90).

COMMUNICATIONS

Communication with the outside world by sea is provided in the same way as for Uvea (p. 250).

The settlements on Futuna are connected by a broad footpath which runs round the island; except for a few detours over ridges, it lies close to the sea. Between the districts of Singave and Alo, and between the villages of Vele and Loloua, the road divides into two routes—a shore way passable only at low tide, and an interior way across the ridge some distance inland. In some villages the path is lined with kerbstones. The bridges that cross the small streams consist of a few large logs hewn flat on the upper surface and resting on abutments of piled earth faced with stone. Construction and repair of these bridges is the task of the villages within whose boundaries they lie. In the interior of the island tracks are few and little used; except for two across the island from Ono to Poi, one of which is passable for horses, these tracks are only narrow paths from which brushwood is occasionally cleared. Puke, the highest mountain, may be ascended by tracks from Vaisei and Leava and also from Alo; an old track from Nuku was overgrown in 1932.

On Alofi there is a broad path leading up from the (temporary) village of Alofitai to the central plateau; it continues approximately along the centre of the island, with minor tracks leading off it to plantations. A shore track leads from Alofitai to Saavaka (on the south side of the island), and the beach on the northern side is passable except at high tide. Since there are no streams on Alofi, the main path has no bridges.

In 1938 a W/T station was stated to have been opened on Futuna, but no record of it is given in standard publications.

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For maps see Appendix I.

Chapter VIII

GILBERT ISLANDS, ELLICE ISLANDS, OCEAN ISLAND AND NAURU

Physical Geography: History: Population Density and Trend: The Native People:
Administration: Social Services

The Gilbert islands, Ellice islands, Ocean island and Nauru lie nearly in mid-Pacific, forming an arc to the west of the meeting-point of the equator and the 180th meridian. The 25 islands of the



Fig. 88. Gilbert islands, Ellice islands, Ocean island and Nauru
The dotted shapes represent major atolls. (For *Tabiteuea* read *Tabiteuea*.) Based on Admiralty charts nos. 780, 781, 1830.

Gilbert and Ellice groups form a chain of coral islands and atolls roughly between lat. 4° N and 11° S, long. 170° E and 180° . Ocean island lies some 250 miles to the west of the Gilbert islands and Nauru lies some 170 miles further west again (Fig. 88). The

Gilbert and Ellice islands are of little commercial interest but have a strategic position of some importance in relation to the Western Pacific—being for instance on the flank of the Marshall and Caroline islands, which the Japanese have used as bases. Ocean island and Nauru are of great commercial value as sources of phosphate. The Gilbert islands, Ocean island and the Ellice islands constitute the main part of the Gilbert and Ellice Islands Colony, a British Crown Colony administered by the High Commissioner for the Western Pacific at Suva, Fiji. His immediate representative is the Resident Commissioner, whose headquarters before the war were at Ocean island. (Fanning, Washington and Christmas islands, some 1,800 miles to the east of the Gilbert islands, and the Phoenix group, some 600 miles to the east of the Gilbert islands, which also form part of the Gilbert and Ellice Islands Colony, have already been described—vol. II, chapter XI.) Nauru is a British mandated territory administered by the Commonwealth of Australia.

The Gilbert islands, Ocean island and Nauru were either occupied or controlled by the Japanese almost immediately after the outbreak of hostilities, but the Ellice islands have remained under British control.

In this chapter, despite the difference of administration, Nauru and the other islands are treated together because of their proximity, their many general resemblances, and the particular association of Nauru and Ocean island in phosphate extraction.

PHYSICAL GEOGRAPHY

Structure

From the geographical point of view, all the islands are of one basic type. They are of coral formation, built up on the submerged peaks of mountains rising from the deep ocean bed, and having been subjected to alternate sinking and elevation in the past. The detailed investigation of the atoll of Funafuti by several scientific expeditions from 1896 to 1898 revealed the general structure. The underwater form of the atoll resembles a gigantic fortress wall crowning a conical mountain. The nearly circular base of the mountain, at a depth of 2,000 fathoms, which is the general level of the ocean floor in this part of the Pacific, measures about 30 miles long by about 28 miles broad. From this the mountain rises in a gradual but steepening slope to the submarine contour line of 400 fathoms, thence at an average angle of 30° to the 140-fathom line,

and then at an angle of about 75 to 80° until about 15 fathoms from the surface, when it rounds off to pass into the shallow flat of the growing reef. On the surface a pear-shaped ring of islets and reefs enclose a lagoon about 10 miles long and 8 miles broad. The com-

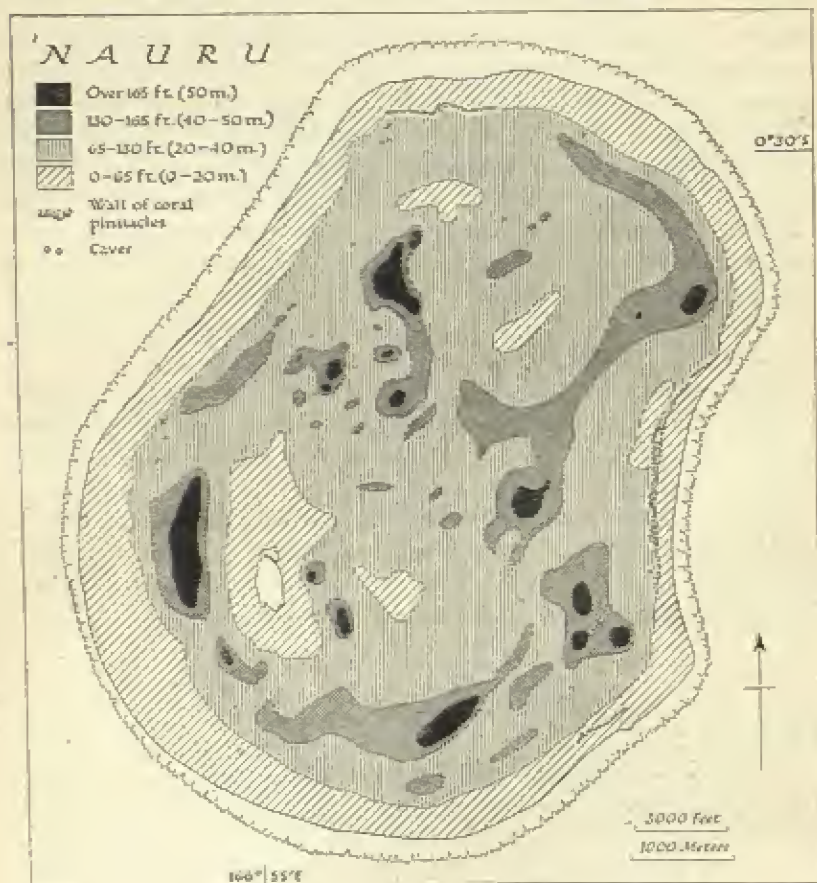


Fig. 89. Nauru: physical

Based on: (1) C. Elschner, *Corallogene Phosphat-Inseln Austral-Oceaniens*, Tafel iva (Lübeck, 1913); (2) P. Hambruch, 'Nauru', *Ergebnisse der Südsee-Expedition 1908-10*: "II. Ethnographie: B. Mikronesien, Bd. 1, Halbband 1, end map (Hamburg, 1914); (3) Admiralty chart no. 979.

position of the atoll was studied by boring with the diamond drill, and a final bore which passed down through coral reef and sand to a depth of over 1,100 ft. found coral reef rock throughout. The lower part of this is considered to be talus.

In physical appearance the islands show some variation. Most are atolls, with a ring of reefs and islets enclosing lagoons, the land surface being as a rule only 10 to 15 ft. above the sea. Among these, Marakei (Fig. 106) in the Gilbert islands is one of the most perfect in shape; the geologist Dana likened the view of it from the mast-head of a ship to that of a garland thrown upon the water. In the majority of these atolls the easterly side tends to be the more elevated and the westerly side to consist of more or less submerged reefs, owing to the action of the prevailing easterly winds which results in the heaping up of broken coral and debris on that side. An exception is Butaritari in the Gilberts, where the elevated portion is on the south and west and the submerged reef on the north; this is the result of the westerly currents that tend to prevail to the north of the equator. The general form of the atoll above water is a narrow strip of land, from 200 yd. to $\frac{1}{2}$ mile in width, and often broken up into small islets (Plate 36). The lagoon is in some cases accessible by passages from the sea, but in others is completely enclosed by reefs. In depth it ranges from 3 to 4 fathoms to about 30 fathoms, studded with coral patches rising nearly to the surface, and its floor is normally of growing coral or coral sand, though Abemama in the Gilberts has a lagoon floor of soft grey mud in places. By contrast with the quiet wavelets of the lagoon beaches, a heavy surf breaks on the ocean side of the atoll.

A few of the islands—such as Kuria, Tamana, Arorae and Nikunau in the Gilberts; Nanumanga and Niulakita in the Ellice group; Ocean island and Nauru—are not atolls, but consist of solid masses of limestone surrounded by fringing reef. All are very low and flat, with the exception of Ocean island and Nauru, which have a maximum elevation of more than 200 ft. above sea level (Fig. 89). These last two islands are noteworthy from the fact that their limestone surface is deeply impregnated with phosphate; together they constitute the most important source of phosphate in the Pacific.

Coasts

Since nearly all the islands of the region are so low and flat they present no coastal features of note except the individual details of each reef system. Beaches of coral boulders, shingle or sand are common, but access to them from the sea is often difficult owing to surf breaking on the reef.

Ocean island and Nauru have more character. Each island has a fringing reef, the outer edge of which slopes down to the sea bed at

a steep angle and to a great depth. Behind its reef, which dries out at low tide, Ocean island has a rugged coastline, with low cliffs of hard, jagged limestone rock up to 30 ft. high everywhere except for a stretch on the south-west side, where there is a beach of white coral sand and shingle. In many places along the reef of Nauru or on the margin of the reef and foreshore, particularly on the north and east sides of the island, there are coral pinnacles (Plate 38) standing singly or in groups, giving a forbidding appearance to the

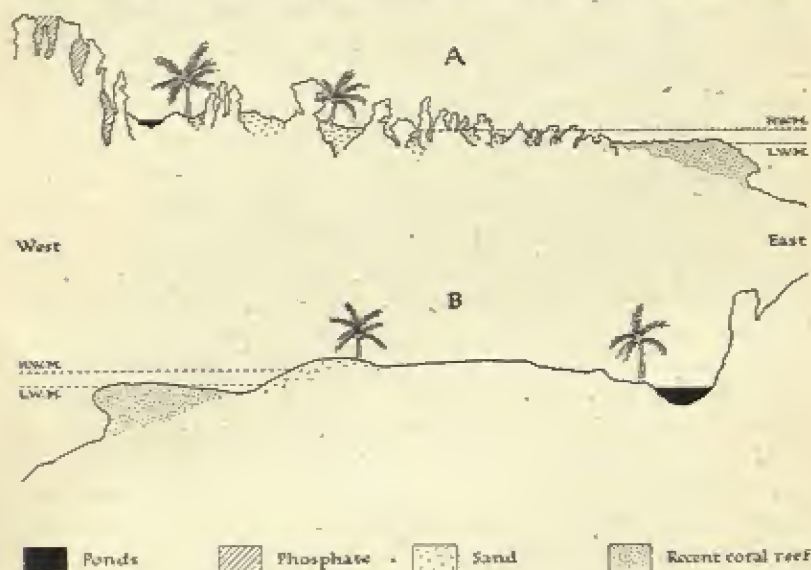


Fig. 90. Nauru: sections through beaches

A shows coral pinnacles which stand in parts of the east side of the island; B shows unencumbered beach on the west side. Beneath the superficial deposits lies older coral limestone. No scale can be given, but the cliff illustrated in A reaches a height of 100 ft. in some places. Based on C. Elschner, *Corallogene Phosphat-Inseln Austral-Oceaniens*, Tafel III, a and b.

coastline. Behind the reef Nauru has a sandy beach fronting a low flat coastal belt several hundred yards wide (Plate 40). At the back of this the land rises for 100 ft. or so either in moderate slopes or in a line of rough limestone rocks which in places are so regular as to form cliffs (Fig. 90).

Anchorage

Conditions of anchorage and landing vary considerably at the different islands. In the Gilbert islands the best anchorage is at

Tarawa, where there is a good passage through the reef and secure holding in the lagoon. Butaritari and Abemama have good passages into the lagoon; Abaiang a passage for vessels drawing 14 ft. or less; and Tabiteuea a passage for vessels drawing 12 ft. or less. There is also a ship entrance into the lagoon at Nonouti, but it is intricate. Each of these atolls has anchorage in the lagoon. The remainder of the islands have poor lagoon anchorages or none at all. In the Ellice group there are only two good anchorages, at Funafuti and at Nukufetau, each having a good ship channel into the lagoon. At the other islands of the group anchorage is outside the reef or lacking altogether. At Ocean island and Nauru there is no anchorage for large vessels, but good systems of deep-sea moorings are available. Nauru, by reason of its trend and larger size, has a larger lee than Ocean island, and the better shelter thus afforded to shipping has been an important feature in the greater development of the phosphate industry there.

Landing on all of the islands is by launch or boat, and is often impossible in a westerly wind. It may at any time be a lengthy operation, since vessels often anchor several miles off the land and transfer passengers and cargo to surf-boats or native canoes.

(Further details of anchorage and landings are given in the sections on ports and individual islands, pp. 359-60, 368-83.)

Climate

The climate of the islands is pleasant, being warm but not particularly humid. It is tempered by the trade winds, and the nights are comparatively cool for the equatorial regions.

In the Gilbert islands the prevailing winds are easterly throughout the year. From November to March they tend to be light and variable, with frequent calms, occasional winds between west and north, and short periods of squally weather in which the wind rarely reaches gale force. Butaritari is the only island of the Gilbert group which has been known to experience cyclonic storms, and only one severe disturbance of this type has been reported with certainty, in December 1927. In the Ellice islands the prevailing winds are light and from the north-east, turning to the east or south-east and becoming of moderate force in July and August. In February 1891 there was a severe hurricane—the only one recorded for the group. At Ocean island and Nauru the prevailing wind for the greater part of the year is the easterly trade wind, not blowing strongly, and accompanied by fine weather. From November to February variable

conditions are apt to occur, with squalls coming up from any direction and often veering round and blowing onshore. Sometimes, but not every year, strong westerly winds blow, with squalls of great force and heavy rains. This squally westerly weather does not usually last for more than two or three days, but in exceptional conditions may last for a week or ten days. Such weather was experienced at Nauru in December 1940 and was responsible for a concentration of shipping which, while waiting to load phosphate, was severely attacked by a German raider. Sometimes these strong westerly winds affect Nauru but do not extend as far as Ocean island.

Currents are of the strong equatorial type, setting to the westward

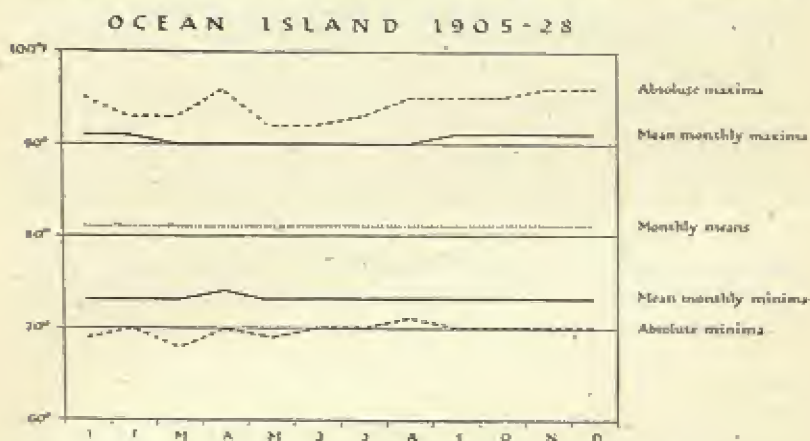


Fig. 91. Monthly temperatures, Ocean island, 1905-28

Based on data from Admiralty *Pacific Islands Pilot*, vol. 11, 6th edition, p. 315 (London, 1932).

in the Ellice islands and the southern Gilbert islands but becoming irregular farther north, and tending to develop as the counter-current to the eastward around the islands to the north of the equator. At Nauru the current, which normally sets strongly to the westward, either ceases or is replaced by an eastward setting current in westerly weather.

Temperatures in the area are fairly uniform throughout the day and throughout the year. It has been stated that the variation in monthly means for the Gilbert islands as a whole throughout the years 1900-02 was only a little more than 1° F. The period from January to May is slightly cooler than the remainder of the year; the lowest monthly mean temperature is that for May. Temperatures

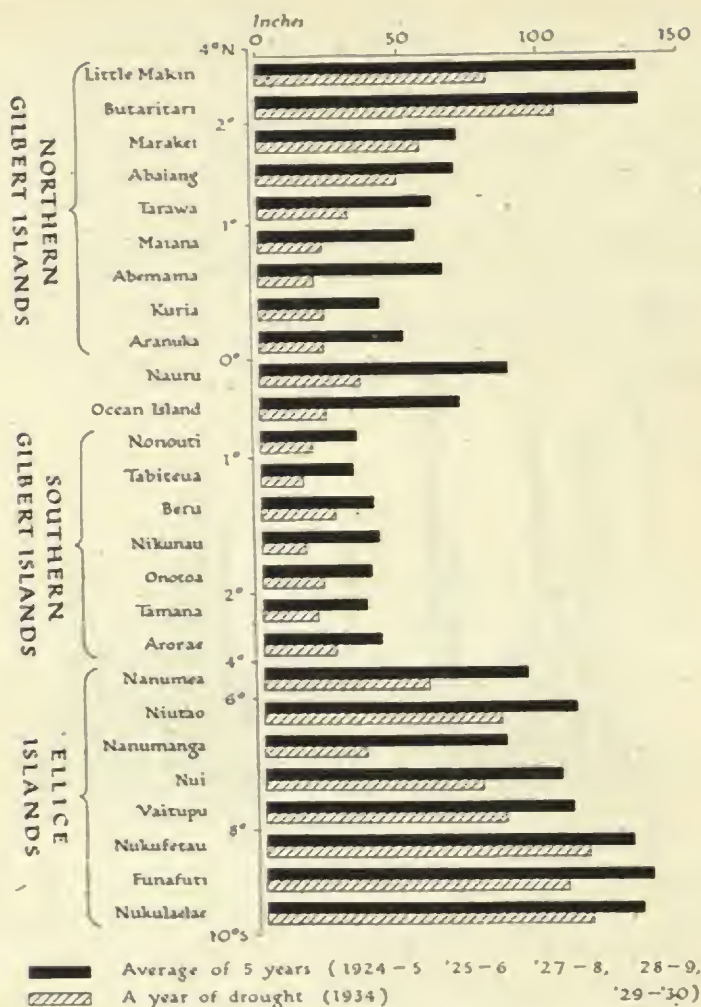


Fig. 92. Comparative annual rainfall, Gilbert and Ellice islands, 1924-30 and 1934

The islands are arranged in order of latitude, from north to south. Rainfall for 1926-7 has been excluded for lack of complete data. The average shows that on the low islands of this region rainfall tends to vary according to distance from the equator. Nauru and Ocean island, which lie more to the west than the others and are of greater elevation, are exceptions. Based on data in: (1) Colonial Office *Annual Report on the . . . Gilbert and Ellice Islands Colony* for various years (London); (2) Commonwealth of Australia *Report to the Council of the League of Nations on the Administration of Nauru*, 1938 (Canberra, 1939).

at Ocean island show an even more marked steadiness, the monthly means for the period 1905-28 remaining constant at 81° F. Temperatures seldom rise above 91° F. or fall below 73° F. (Fig. 91). At Nauru on the average temperatures are about 2° F. higher than at Ocean island. Relative humidity is also fairly constant; it tends to be somewhat higher in the period from December to April than during the rest of the year.

Cloudiness shows no pronounced seasonal variation, mean amounts for Ocean island, for example, ranging between 3-tenths

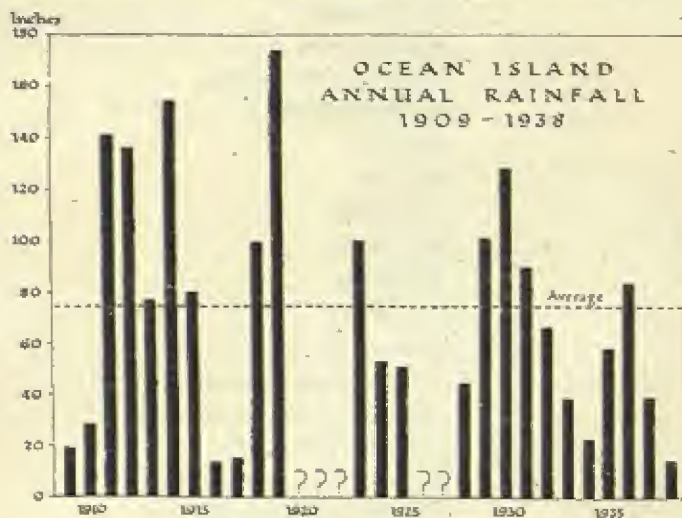


Fig. 93. Annual rainfall, Ocean island, 1909-38

The question marks indicate years for which no data are available. Based on data in: (1) S. M. Lambert, *Health Survey of the Gilbert and Ellice Islands*, p. 4 (Suva, 1924); (2) Colonial Office *Annual Report on the . . . Gilbert and Ellice Islands Colony* from 1918-9 to 1937 (London); (3) *Gilbert and Ellice Islands Colony Medical and Sanitary Report* for 1938 (Suva).

and 5-tenths in all months except January, when the mean amount is rather more than 5-tenths. Cloudiness is apt to be least from April to October. At Ocean island, in the period 1911-30, there were on the average only 34 days in the year with 8-tenths cloud or more, and there were 48 days on the average with clear sky.

A marked feature of the climate is the high degree of variability of the rainfall, not only as between different islands but also from year to year. In what may be termed a fairly normal season, the variation is from about 40 in. on the islands in the vicinity of the equator to about 100 in. in the northern Gilbert islands and southern

Ellice islands. But Ocean island and the central and-southern Gilbert islands are subject to severe droughts lasting for a year or more, in which the annual rainfall of the less fortunate islands may fall to about 20 in. or occasionally to less than 10 in. Fig. 92 indicates the distribution of rainfall on the various islands as one moves from the north to the south of the equator. It will be seen that, though a drought reduces rainfall on Ocean island practically to the level of that of its neighbours, its much greater altitude gives it a considerably higher rainfall in normal years. Droughts are sometimes

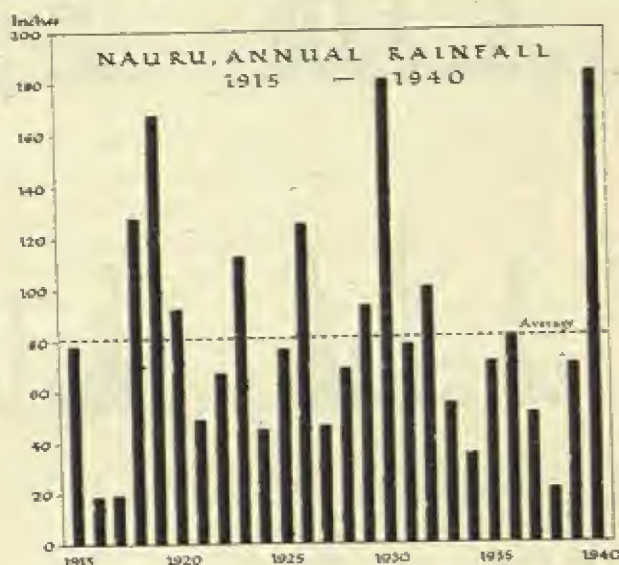


Fig. 94. Annual rainfall, Nauru, 1915-40

Based on data from *Commonwealth of Australia Report to the Council of the League of Nations on the Administration of Nauru* for 1938 and 1940 (Canberra, 1939, 1941).

said to have a rough cycle of about seven years, but there have been four in the last fifteen years—in 1925, 1927, 1934 and 1937. A striking instance of the variation is seen in the case of Ocean island (Fig. 93). From 1930, when it had a rainfall of 128 in., the figure declined to 90 in. in 1931 and then consistently at a rate of roughly 25 in. in a year to the drought of 1934, when the rainfall was 23½ in. (In 1924-5 Ocean island had a rainfall of 12½ in. and in the following year one of 127½ in.) In most of the central and southern Gilberts the variations are not so great as at Ocean island, though the general average rainfall is less. Nauru also has a more regular annual rainfall

312 GILBERT ISLANDS, ELLICE ISLANDS, OCEAN ISLAND AND NAURU
 than Ocean island (Fig. 94), though it too is subject to droughts
 which affect the water supply and the vegetation. But the coconut

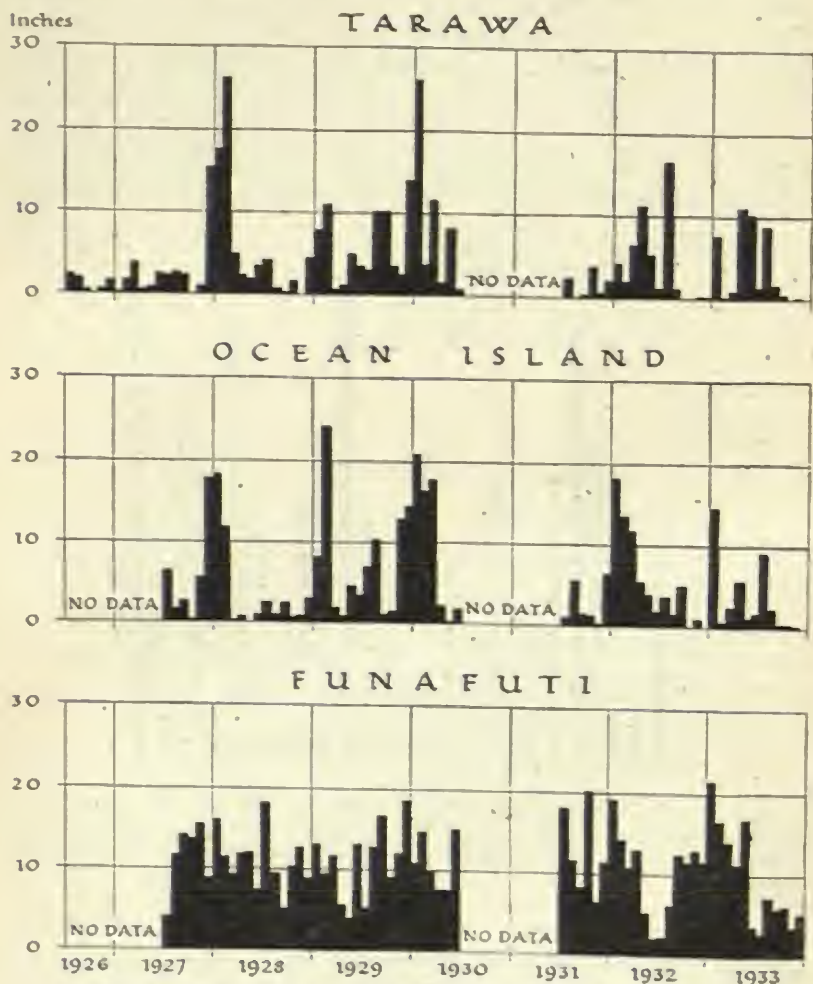


Fig. 95. Comparative monthly rainfall in three islands of the Gilbert and
 Ellice Islands Colony, 1926-33

Tarawa and Ocean island, both near the equator, have rainfall which is less evenly distributed through the year than that of Funafuti, nearly 9° s. Based on data in Colonial Office *Annual Report on the . . . Gilbert and Ellice Islands Colony* from 1926-7 to 1932-3 (London).

lands of Nauru do not suffer to the same extent as those of Ocean island and palms seldom die from drought.

The wettest months in the year tend to be December, January and February, and as a rule the concentration of rain in these months is considerable. Rainfall at Ocean island seems to show some correlation with the frequency of westerly winds. But, as Fig. 95 shows, it is possible for heavy rain to fall in almost any month, especially in the Ellice islands (see for example Funafuti).

Water Supply

In consequence of the porous nature of the coral rock and sand there are no streams on any of the islands and water is apt to be scarce and brackish. On Funafuti and on Niutao, in the Ellice group, wells have been sunk by the natives in the coral, but the water is hardly suitable for drinking. On Ocean island, owing to the porous nature of the phosphate deposits, water does not lie in pools even after heavy rain, and until recent times the caves which honeycomb the island have afforded a most valuable supply to the natives. Each family jealously guarded its cave, and women alone were allowed to collect the water. On Nauru resort to caves was unnecessary, since there are wells in places along the coastal belt near the base of the high ground, and though the water contains a good deal of lime it answered native requirements in former times. Nowadays, as in many of the other islands, drinking water is provided by large concrete cisterns which are filled by rain water from catchment roofs of corrugated iron, or from the thatched roofs of houses. Both cisterns and catchment roofs have been erected by the government or on official initiative. Distillation plants on Ocean island and Nauru provide water for the phosphate industry, and cisterns give storage of 3 million gallons at Ocean island and 2 million gallons at Nauru. In many of the islands, particularly in the Ellice group, the people still rely for drinking largely on the milk of fresh coconuts; but on the poorer islands, especially in the Gilberts, there are often no coconuts to spare.

Nauru is remarkable for its many pools of brackish water, several of them being large enough to be termed lakes or lagoons. All but the largest are in the coastal belt, but this, known as Buada, lies in a depression about 1 mile inland from the west coast (Fig. 89; plate 41). These lagoons are used by the Nauruans as fishponds.

Vegetation

The soil of the Gilbert islands and Ellice islands is of poor quality, consisting mainly of coral sand, with very little organic matter as a

rule, though the proportion of this tends to be higher in cultivated soils, which are often enriched by mulching with leaves. The garden soil on Funafuti and possibly in some other islands has a high phosphoric acid content, possibly due to ancient deposits of bird excrement. The coral limestone of Ocean island and of Nauru has a thick covering of phosphate, and there is very little true soil.

The poverty of the soil, and the variability of the rainfall, are reflected in the quality of the vegetation. From the sea, most of the islands appear to be densely covered in trees and plants, but investigation shows that these comprise a small range of types, and that some of them do not flourish well. The flora of the Gilbert islands, rather more barren than the Ellice group, consists of only about two dozen species, and that of Funafuti, which may be taken as fairly typical of the Ellice islands, consists of about three dozen species. Chief in numbers and importance is the coconut palm, which provides a great variety of economic products. (Contrary to popular opinion, nearly all coconut palms, even on uninhabited islands, have been planted by man.) Next in numbers and utility is the pandanus, which like the coconut grows freely all over these low islands. Timber trees of any size are scarce, but *fetau* (*Calophyllum inophyllum*, a pink hardwood), and *puka* (*Hernandia* sp., a white softwood), are the most common on the larger islands, while *Ochrosia*, which has a hard, heavy white wood, *Barringtonia*, a handsome tree with a large square fruit, and a species of *Gordia* are found on some islands. Other trees and shrubs include hibiscus, occasional paper mulberry, gardenia and native fig, some mangroves in swampy areas, a kind of small casuarina on sterile tracts of coral debris, and *Scaevola*, with a pithy stem rather like an elder, at the margin of the sea. There are herbs, ferns and grasses adapted to the sandy soil, but their variety is small, and there are hardly any climbing or parasitic plants. Of food plants, apart from the coconut and pandanus, the most important is the large coarse *Alocasia*, an aroid allied to the taro. Taro itself (*Colocasia antiquorum*), sweet potato, arrowroot, breadfruit, bananas, and in some places gourds, are also cultivated, but they frequently do not flourish particularly well. On some Ellice islands such as Funafuti, in addition to the wild pandanus, another variety with a larger, sweeter fruit is cultivated; this is said to have been introduced from the Gilberts, where it is a common type.

The vegetation of Ocean island comprises mainly such large indigenous trees as coconut palm, pandanus, *Calophyllum inophyllum* and native almond (*Terminalia catappa*); and introduced



Plate 36. Butaritari, Gilbert islands

A view of part of the east side of the atoll, near Keuea, showing the line of the reef, islets dotted with coconut palms, and the lagoon behind. The photograph was taken in 1900.

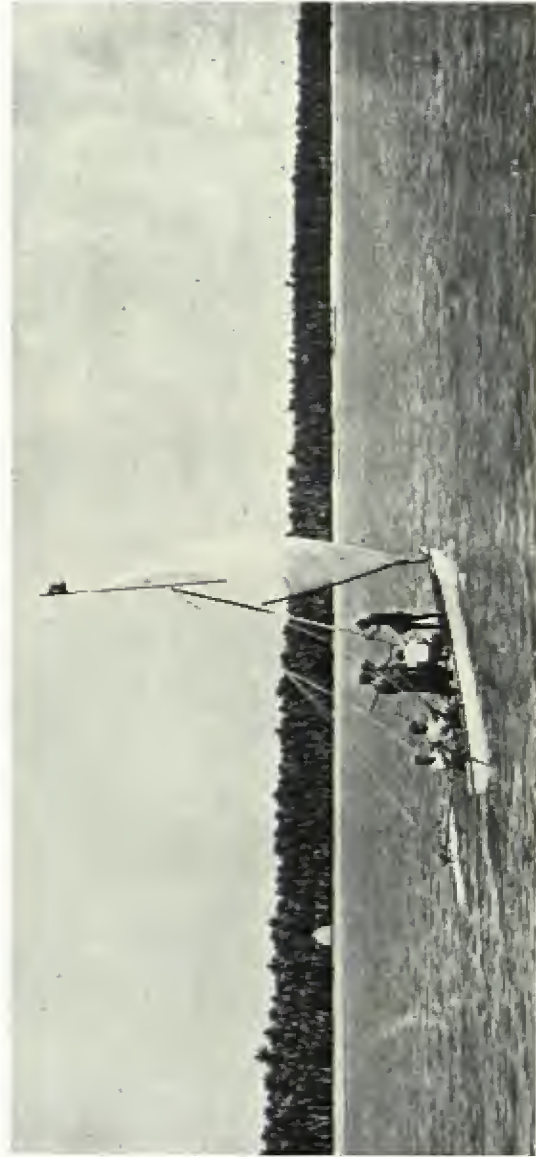


Plate 37. Modern sailing canoe at Funafuti, Ellice islands

Though many of the features of the craft are of European style, the native outrigger has been preserved.



Plate 38. Limestone pinnacles on the reef, Nauru

These pinnacles, the size of which can be judged from the figure on the right, occur especially on the east and north sides of the island. Similar formations, much less eroded, are found throughout the interior of the island beneath the phosphate deposits.



Plate 39. Anibare bay, Nauru

This view, which was taken in 1924, shows part of the road round the island, the narrow beach and the fringing reef beyond.

plants such as papaya, mango, guava, lime, jackfruit and a coarse variety of banana. No yams, taro or sweet potatoes are grown.

Nauru is thickly covered with trees and bushes. On the coast and round Buada lagoon the vegetation is mostly low-growing. Besides grasses, the chief plants here are small bushes and herbs such as *Euphorbia atoto* and *Capparis cordifolia*. The goat's-foot convolvulus grows on the sandy shore, as well as on loose soil on the phosphate lands. Pandanus trees, probably mainly planted by the natives, are common along the edges of the beach. The mangrove *Bruguiera* is found in the salt swamps on the coast and the salt pools at Buada, but not in the main lagoon, which is not salt.

There are two belts of coconut palms: one round almost the entire coast; the other, much smaller, round Buada lagoon. The trees grow thickly, about 5-7 yd. apart, except where they have been thinned.

Above the coastal coconut belt and at the eastern and southern sides of Buada lagoon the ground slopes steeply upwards; these slopes are covered with a dense thicket of *Thespesia populnea*, growing about 20 ft. high and excluding almost all other vegetation.

The woodland on the phosphate lands consists chiefly of *Calophyllum inophyllum* (*ijo*, *tomano*), which grows to 30-50 ft. and is the main source of fuel on the island. Other kinds of trees are few, the commonest being *Terminalia catappa* (*edeto*, native almond) and species of pandanus. The woodland is open, with open spaces or bushes (chiefly *Scaevola frutescens* and *Dodonaea viscosa*) between the trees, and the ground is bare, except in rainy years, when it becomes covered with small herbaceous plants. In some places the shrub *Ficus prolixa* sprawls over coral pinnacles, making impenetrable thickets. The same shrub, often overgrown by the parasitic Devil's Twine (*Cassytha*), is the chief plant colonizing the worked-out phosphate lands.

Fauna

The range of land fauna in this area is small. Birds are perhaps the most important. They include white tern and noddy, frigate bird, and several migrants such as long-tailed cuckoo and sandpiper. Nauru has the white heron and the blue heron. On Ocean island and Nauru catching and taming noddies and frigate birds is a native recreation of some importance. Formerly the catching of frigate birds was more than a mere pastime; an elaborate ritual was attached to it.

The only mammal in pre-European days was the rat, but the dog,

the cat and the pig have now been introduced. On Nauru and Ocean island pigs are kept by the Chinese phosphate labourers and by natives.

There are lizards on the islands, but no snakes. Turtles are fairly common, except at Nauru, and there are many types of crabs, including the robber crab. Mosquitoes are plentiful on most of the islands. On Nauru there are two types: a small brown night-flying type, said to have been brought from the Gilbert islands in the sleeping mats of natives towards the end of the nineteenth century; and a larger black-and-grey type, said to have been brought in a ship from Sydney about 1910. A vector of filariasis, *Aedes variegatus*, var. *pseudoscutellaris*, is common in most of the Ellice islands, but much less so in the Gilberts.

Fish of many kinds are abundant, including bonito, kingfish, flying-fish, and especially in the waters around the Ellice islands, castor-oil fish (*Ruvettus*). Small octopuses are also common, and are taken as food.

HISTORY

It is almost certain that some of the islands of the Gilbert group were visited by the Spaniards Grijalva and Alvarado in 1537, and most probable that one of the Ellice islands was sighted by Mendaña in 1568. Captain Byron seems to have seen one of the easterly clusters of the Ellice islands in 1765. But final discovery of the islands in the area did not come until later. Some of the Gilbert islands were discovered by Captains Marshall and Gilbert of the British ships *Scarborough* and *Charlotte* in 1788. Other discoveries were made by the British trading vessel *Nautilus*, Captain Bishop, in 1799, and the brig *Elizabeth*, of Sydney, in 1809. Nauru was discovered by Captain Fearn, of the *Hunter*, of Calcutta, in 1798, Ocean island by the ship *Ocean* in 1804, and Funafuti by Peyster, of the *Rebecca*, in 1819. Captain Duperrey visited the islands in 1824, in the French corvette *Coquille*, and partially explored many of them. Both the Gilbert and Ellice groups were fairly completely surveyed by the United States Exploring Expedition, under Captain Wilkes, in 1841.

Between 1830 and 1840 sperm whalers began to frequent the waters in the neighbourhood of these islands. In 1835 the whaler *Corsair* was wrecked on the Nautilus shoal at the south end of Tabiteuea, from which place her crew made remarkable voyages in open boats to the Caroline and Marianas groups. Many sailors

deserted from whale ships and settled on shore among the natives, and natives themselves occasionally took service on board the ships. Some of the consequences of this contact between natives and Europeans were far from happy. On Nauru, about 1830, men said to have been escaped convicts from Norfolk island were killed and eaten; and in 1841 the majority of the Europeans then residing there were murdered by one of their own number. At the same time the Nauruans had begun to acquire firearms, and, encouraged by their new weapons and assisted by European residents, they seized a whaler some time after 1840 and the American brig *Inda* in 1852. Minor outbursts of fighting between Europeans and natives seem to have been fairly frequent on many islands.

Regular trade, however, had also begun to grow up. The first European trader is said to have settled in the Gilbert islands in 1837; Wilkes, four years later, recorded the presence of several. At first, in all the islands, trade centred upon fruit and vegetables and native curios, which were sold to the whalers. Then about 1860 trade in coconut oil began, to give way in ten or twenty years to the preparation of copra.

In 1857 came the first mission contact. The Rev. Hiram Bingham, one of the pioneer American missionaries, was landed by the Hawaiian Board of Missions at Abaiang in the Gilbert group, and lived there for seven years, while later Hawaiian native teachers were placed on other northern islands. In 1871 the Rev. J. S. Whitmee of the London Missionary Society visited the Ellice group and the southern Gilberts, and Samoan teachers of the Society were landed at Arorae, Tamana, and adjacent islands. The inhabitants became Christians fairly rapidly. In 1888 the Roman Catholic Society of the Sacred Heart entered the central Gilberts, and in 1912 Ocean island. In 1899 the Hawaiian Board of Missions established a station on Nauru, and a few years later the Society of the Sacred Heart did the same. In 1917 the Hawaiian Board of Missions transferred its interests to the London Missionary Society. Both existing missions have stations on every island of the Gilbert group except Arorae and Tamana, which, together with the whole of the Ellice group, are under the control of the London Missionary Society alone.

During the greater part of the nineteenth century the islands were free of all external control. They were ruled nominally by the natives themselves, but runaway sailors, traders, and (later) missionaries or native teachers often exercised considerable control. The dangers of this lack of protection were demonstrated by the

activities of Peruvian labour raiders soon after 1860. These 'black-birders' carried off large numbers of men and women to the phosphate fields and plantations of Peru, particularly from the Ellice islands. From Nukulaelae they took nearly 300 out of an estimated population at the time of about 400; none came back. Funafuti was similarly depopulated. Later recruiting for the plantations of Fiji, Samoa and Tahiti reduced the population in the same way.

On some islands, as Abemama, Butaritari and Funafuti, hereditary native chiefs were in a position of such authority that they were known to Europeans as kings. Some of them owned trading vessels, and one, the King of Butaritari, entered into political relations with King Kalakaua of Hawaii (vol. II, p. 322).

But internally the governments were not always able to maintain peace. On Nauru war broke out about 1878 between the people of the north and south of the island, the village districts of Meneng and Arubo being the chief protagonists. Initially the quarrel is said to have been caused by drunkenness, but it later took on the character of a blood feud. Many people were killed on both sides, and great numbers of coconut palms were destroyed.

At this time German interest in Nauru was growing. The copra trade was in the hands of the Jaluitgesellschaft, with headquarters in the Marshall islands. In October 1888 the island was visited by the German warship *Eber* and placed under German rule. Subsequently it was considered for administrative purposes as part of the Marshall islands protectorate. In 1892 a British protectorate was proclaimed first over the Gilbert islands and later over the Ellice islands by Captain Davis of H.M.S. *Royalist*. In 1900 the jurisdiction of the Resident Commissioner was extended to Ocean island, which, eight years later, was made the administrative headquarters of the protectorate. The Gilbert and Ellice groups were annexed as a Crown Colony in 1915, at the expressed wish of their people; Ocean island was similarly annexed in 1916. (Fanning and Washington islands and the Tokelau (Union) group were also included in the boundaries of the colony in 1916, Christmas island in 1919, and the Phoenix group in 1937. In 1925 the Tokelau group was excluded and placed under the administration of New Zealand—vol. II, pp. 471-2, 508.)

Nauru remained under German administration until 6 November 1914, when it was occupied by an Australian expeditionary force. Meanwhile, as also on Ocean island, phosphate deposits had been discovered by a British company and worked (pp. 351-4). Their

proved extent and quality made Nauru important. In the Versailles treaty Germany renounced all her rights in the island. The mandate over the island was claimed by Japan, but it was conferred on the British Crown. An agreement laying down the terms of the administration, and entrusting it to the Commonwealth of Australia, was signed by the governments of Great Britain, Australia and New Zealand on 2 July 1919. A supplementary agreement was signed on 30 May, 1923. (For events in Nauru and the other islands since 1939, see Appendix III, pp. 710-12.)

POPULATION DENSITY AND TREND

Density

The islands discussed in this chapter are for the most part densely populated. They have a total population of nearly 40,000, and the total land area is only about 190 sq. miles, giving an average density of about 200 persons per sq. mile. In the Gilbert islands, whose inhabitants amount to about three-quarters of the total population, the density on six of the larger islands in 1936 was between 200 and 300 persons per sq. mile, while on Tamana it was over 500. In the Ellice group Nanumea, Nanumanga and Nui had densities of over 300 persons per sq. mile. On Ocean island, with its phosphate workings, density of population was about 1,000 per sq. mile, and in 1940 the density of the native population on Nauru was over 200 per sq. mile and that of all elements of the population about 395 per sq. mile.

Composition

As a whole, the population of the area is overwhelmingly Oceanic 'native' in composition. The last complete census of the Gilbert islands, Ocean island and the Ellice islands, taken in 1931, gave the following figures:

Islands	Europeans	(Oceanic) Natives	Asiatics	Mixed- bloods	Total
Gilbert islands	94	26,178	37	219	26,528
Ocean island	129	1,780	400	—	2,309
Ellice islands	13	4,045	—	16	4,074
Total	236	32,003	437	235	32,911

Based on: Colonial Office *Annual Report on the . . . Gilbert and Ellice Islands Colony*, 1937, p. 5 (London, 1939). The total population of the colony as a whole was then 33,416 (including the islands of the Phoenix group and of the Fanning Island District). Slight differences in the figures occur in various publications.

The last available annual census of Nauru, taken on 31 December 1940, gave the following result:

Europeans	Nauruans	Other Pacific Islanders	Chinese	Total
192	1,761	49	1,350	3,352

Based on: *Report to the Council of the League of Nations on the Administration of Nauru*, 1940, p. 24 (Canberra, 1941). Nauruans absent from the island numbered 39.

The European element in the population consists of government officials, traders and missionaries scattered throughout the islands, and—by far the largest single group—the employees of the British Phosphate Commission on Ocean island and Nauru. The Asiatics are mainly Chinese from Hong Kong employed as mechanics and labourers in the phosphate works. The number of people of mixed blood appearing in the census is small, but it is generally recognized that many classed as 'natives' or Nauruans have some admixture of European or Asiatic blood. In the last twenty years a new factor has entered. It has apparently been Japanese policy to force out from the Marshall islands the mixed-blood descendants of former German officials and traders, and these people have in many cases come down to settle in the Gilbert islands.

Trend

Throughout the area the general trend of the native population has been a decline until about the second decade of this century, after which a fairly steady increase has taken place. An example of these changes can be seen in the southern Gilbert islands from 1876 to 1936:

Island	1876	1883-6	1895	1901-2	1911	1914	1921	1931	1936
Nonouti	4,500	—	—	2,924	2,601	2,622	2,273	2,255	2,255
Tabiteuea	7,000	7,500	—	4,343	3,858	4,368	3,590	3,702	4,039
Beru	2,500	2,000	—	2,309	2,305	2,219	2,170	2,241	2,498
Nikunau	2,000	1,850	1,684	1,681	1,715	1,708	1,647	1,674	1,854
Onotoa	950	1,052	967	1,398	1,585	1,542	1,425	1,639	1,687
Tamana	1,700	570	—	769	870	—	814	989	1,027
Arorae	600	1,200	960	1,050	1,282	—	1,225	1,451	1,520

Based mainly on: C. M. Woodford, 'The Gilbert Islanders', *Geographical Journal*, vol. VI, p. 343 (London, 1895); Colonial Office *Annual Report*; other official sources.

The main reason for the decline was introduced disease, supplemented in the earlier years by labour recruiting (as in the case of Tamana) and by war. A reduction of the death rate and in particular of the infant mortality rate by medical work, and possibly also the attainment of some degree of immunity, have produced the change. In the Gilbert islands and the Ellice islands as a whole the excess of native births over native deaths during the last decade has been on a rough average about 300 per annum, representing an annual population increase of about 1 per cent.; for Nauru the corresponding excess has been about 30 per annum—about 2 per cent.

The trend of the native population in recent years is indicated by the following sequence:

Native Population

Islands	1921	1926	1931	1936
Gilbert islands	23,220	23,428	26,178	26,979
Ocean island	1,356	1,893	1,780	1,777
Ellice islands	3,429	3,582	4,045	3,818
	28,005	28,903	32,003	32,574
	(1923)			
Nauru	1,164	1,251	1,426	1,647
Total	29,169	30,154	33,429	34,221

Based on: Colonial Office *Annual Report on the Gilbert and Ellice Island Colony* (various years); *Gilbert and Ellice Islands Colony Blue Book for the Year 1936*, p. 44 (Suva, 1939); *Report to the Council of the League of Nations on the Administration of Nauru during the Year 1940*, p. 24 (Canberra, 1941). Totals for 1936 other than for Nauru have been calculated from the numbers of males and females given for each island in the *Blue Book*; some of the other figures given in the *Blue Book* do not agree with these detailed ones. The native population for 1936 is given in the *Pacific Islands Year Book* (Sydney, 1942), p. 156, as: Gilbert islands, 26,231; Ocean island, 1,777; Ellice islands, 4,122 (*recte*, 4,124). Rather less than one-half of the natives on Ocean island are local natives; the majority are Gilbertese working in the phosphate industry.

This growth of population, while evidence of improvement of conditions, has on some of the islands presented problems to the people and to the administration.

In such islands, especially on Beru, Arorae and Onotoa, though the population growth has not been especially marked, it has given rise to distinct pressure on the land. Moreover, there is an increasing tendency for a larger proportion of the population to consist of children and young people, whose families will in time need room

for expansion. In former times abortion and infanticide served as deliberate population checks, but the former has decreased and the latter been abandoned with the establishment of European rule. Moreover, the modern system of a money economy means that the native is no longer able to consume all his coconut resources, but must convert a part into copra in order to secure cash, thus reducing the number of people which each island can afford to support. In former times emigration to other islands also served as a safety-valve for population pressure. In accordance with this principle, the government of the Gilbert and Ellice Islands Colony assisted the emigration of about 1,000 people from the Gilbert islands, at their own request, to the islands of Manra (Sydney), Orona (Hull) and Nukumaro (Gardner) in the Phoenix group (vol. II, pp. 472, 499-501). This measure has proved very successful.

THE NATIVE PEOPLE

The native peoples of this area are on the borderline separating three great divisions of Oceanic peoples—Polynesian, Micronesian and Melanesian. The people of the Gilbert islands may be classed as primarily Micronesian, having their closest affinities with those of the Marshall islands and other groups to the north-west. But a reconstruction of their history, based partly on their traditions and partly on their physical and cultural relationships, supports the view that the islands were colonized by a number of migrations, including not only some from the Marshall islands but also others from Ocean island and from Samoa. The result is that the Gilbertese form a bridge between Micronesians and Polynesians, though most akin to the former. Closely allied with them are the people of Ocean island and of Nui (in the Ellice islands), both of which were colonized wholly or in part from the Gilbert islands. The people of the Ellice islands are Polynesian, with their closest affinities with the Samoans to the south. The people of Nauru are more difficult to classify. Their origin is not known and they have no legends telling of any former home overseas. Though physically they often resemble Polynesians closely, their speech is not Polynesian; both this and their culture show Micronesian affinities, though Melanesian elements have also been identified.

PHYSICAL TYPE

The people of the Gilbert islands are moderately tall—the average stature of the men is 5 ft. 6 in.—and have skin of a coppery to light brown hue. Their hair is black, glossy and straight, without the wavy character of that of Polynesians. Their prominent cheekbones give a flattened look to the face, suggesting Mongoloid affinities. As a rule, the people are leaner than the neighbouring Ellice islanders, who are inclined to become corpulent as they get old.

The Ellice islanders are about as tall as the Gilbert islanders, the average stature of the men being nearly 5 ft. 6 in., but the skin colour is apt to be rather lighter. Though variable, it is often a fawn or light coffee shade. The hair is normally black and wavy, though it is sometimes curly; occasionally it has a reddish-brown tinge. The nose is somewhat flattened and broad, and the lips are moderately thick.

The people of Nauru are of more mixed physical type. Both Melanesian and Polynesian types have been identified, but the distinctions are not very marked, and in any individuals the traits of the two types frequently merge. In general, the people seem to be most closely related to Polynesians. Physically they are well proportioned and of robust appearance. In stature the men range between 5 ft. 3 in. and 5 ft. 8 in.; the women are rather smaller. The skin colour is a light yellowish brown or reddish brown, and the hair is dark brown or black, either straight or wavy or even curly. The eye opening is straight, and the epicanthic fold is uncommon. The nose is broad, and the lips moderately thick. Anthropological measurements have been made of only a few individuals, but it seems that the skull is dolichocephalic. The physical type is complicated, however, by the considerable amount of miscegenation that has occurred. Intermarriage has taken place with Gilbertese and Marshall islanders, a large number of people have European blood, and some can trace descent from two American negroes who lived on Nauru at one time.

LANGUAGE

The languages of the Gilbert islanders and the people of Nauru are Micronesian in character, and are markedly different from that of the Ellice islanders, which is Polynesian. These Micronesian languages, in contrast to Polynesian, frequently end a syllable with a

consonant, use suffixed possessive pronouns instead of separable pronouns before the noun, and have in general a more complex grammatical structure. In Nauruan, for instance, the numeral system varies according to the type of object described, and there are very many forms of pronouns, including dual and trial forms as well as plural. The language of the Ellice islanders at the present day is so closely related to Samoan that it may be considered as practically a Samoan dialect (vol. II, p. 610). But many words in old songs show that there was formerly at least a linguistic relationship with Tongan. There is also a very close resemblance between the speech of Vaitupu in the Ellice islands and that of Tikopia (p. 696), a Polynesian outlier in the Solomons having connections with a number of islands apart from Samoa.

With all these languages there were previously difficulties of orthography such as have already been mentioned in the case of Tongan and Fijian, in particular with the use of *p* or *b*, and with the use of *g*, *ñ*, or *ng* for the single *ng* sound. Recently a standardized spelling has been achieved for the Gilbert islands, and another for the Ellice islands. The rules for the former include the use of *b* and not *p* in all words except foreign words written in the original with *p*, when *p* becomes optional (as *beba* or *pepa* for paper; but *batika* only and not *patika* for bicycle). In the Ellice islands, on the other hand, the range of sounds between *b* and *p* is now represented by *p* alone (*pasika* and not *basika* is the correct way of writing bicycle). In both Gilbert islands and Ellice islands orthography, *ng* has been adopted as the only method of representing that nasal sound.

Nauruan has a standardized orthography, but this does not conform to the same system of symbols as is now in use in the other islands—*ñ* is used for the *ng* sound, and whereas Gilbertese has now abandoned the use of diacritical signs, Nauruan uses them with the vowels *a*, *o* and *u* to indicate nasality.

CULTURE

The culture of the native peoples of this whole area has many features in common, owing largely to the general environment of low coral islands, scarcity of water and poverty of good soil and vegetation. In many ways the life of the people tends to be regulated by their dependence on fish, coconut, pandanus and the coarse variety of taro (*Alocasia*, known in the Gilberts as *babai* and in the

Ellice islands as *pulaka*). The relative importance of these varies in different parts of the area; the Gilbert islanders have been characterized as 'a pandanus people' from the extent to which they rely on that tree and its fruit.

The simplest method of describing the native cultures is to examine them in the following order: the Gilbert islands; Ocean island (Banaba); Nauru; the Ellice islands.

Gilbert Islands

The people of the Gilbert islands live in villages, which are a modern development, concentrating the population from the small settlements which were common in pre-European times.

Each family ordinarily has a sleeping house and a cook-house, with perhaps a separate eating house as well. These houses are lightly built, with a roof of pandanus-leaf sheets or thatch supported on posts, and open sides which can be closed for privacy or in bad weather. Each village has its communal meeting house (*maneaba*), a building larger than the others, with a shingle floor covered with coconut-leaf mats. This is the centre of the social life of the village. The interior is divided by the roof beams or the rows of pandanus thatch into a number of ceremonial seating-places, a man's position being determined by the kinship group to which he belongs. In former times each major local unit also had a temple, or 'house of the ancestral gods', in which ceremonial feasts took place and offerings were made, and commonly, a kind of club-house for the young unmarried men. Nowadays a church has replaced these.

Social Organization. A dominant feature in the Gilbertese social structure is the clan system. This is an organization of large groups of people linked together by common ancestry in the male line, with their members scattered through the various island groups. The clans are in theory exogamous—that is, every person must marry someone from outside his or her own group—but in recent times this rule has largely broken down. They are also totemic, each having a fish or other natural species or object as an object of veneration, considering it as the 'body', or material representation, of their particular ancestor or ancestress from whom they claim descent. Formerly a portion of each meal was set out as an offering to the totem. The practice of not eating any of one's totem fish or animal has now almost ceased, and it is estimated that even by 1934 not more than 10 per cent. of living Gilbertese remembered what their totems were. The clans are known by distinctive names.

and till recent times each had its own canoe-crest or badge which could be flown at the peak of a sailing canoe by a member of the clan. Nowadays, however, most of these crests have been forgotten.

Gilbertese society is characterized by differences of rank, the system of chieftainship being especially developed in islands from Abemama to the north. In this region in former times the chiefs had the privilege of polygyny, and an extension of marital rights also occurred by a process of wife-exchange.

The tenure and inheritance of land rest primarily on the principles of kinship organization. The basic land-owning unit is the local group of patrilineal kin, and though parcels of land are occupied and worked by individuals as their own private property, such lands normally may not be transferred by sale or gift, but should be handed down to the customary heirs, the children or brothers and sisters. In general, lands tend to be inherited in the male line, the eldest son often getting the largest share, but rights to land may also be acquired by women and transmitted through them.

These broad principles of land tenure and inheritance are qualified, however, by certain customary exceptions, one of the most important arising through the prevalence of adoption. The adoption of children, mostly arranged at birth, springs from a desire for companionship and help in old age, for someone to carry on the family, or for the cementing of a friendship with the parents of the adopted child. In the northern and central Gilberts adoptive relations are allowed only between people of the same kinship group; but in the southern Gilberts the child of a stranger may be adopted. In the former area an adopted child is called 'child' or 'grandchild'; in the latter all adopted children are called 'grandchildren'. The adopted person can belong to the clan of his real or his adoptive parent, and usually takes his seat in the communal meeting house by the side of his adoptive father. The real parents of the child give the adoptive parent a piece of land, a fishpond or a cultivation pit (where the *Alocasia* food plant is grown) to repay him for his trouble in bringing up the child, and repeat such gifts from time to time until the child is adult. On the death of the adoptive parent the child receives a share in his lands and other property, though usually a little less than the share of a real child; in addition he gets a share in his own father's land. But in cases where the adoption takes the form of a reciprocal exchange of children, as sometimes occurs, the child can have no share in his real father's lands.

War. The Gilbertese in former times were noted warriors,

making many forays to neighbouring island groups. They used as weapons formidable spears and swords of coconut wood armed with sharks' teeth, each tooth being drilled with small holes at the base and lashed to the shaft with fine twist. In addition they had spears tipped with the spine of the sting ray. These weapons were capable of inflicting dreadful wounds, and a notable feature of their warfare was the development of protective armour. This was made of plaited fibre, like coconut matting, thick and stiff, and consisted of a coat with a high collar protecting the head and neck, and coverings for the arms and legs, with sometimes a helmet as well. Thus clad, a Gilbertese warrior resembled a European medieval knight.

Canoes. Like all the native peoples of this equatorial region, the Gilbertese are excellent fishermen and canoemen. Their many methods of catching fish include trolling for bonito and netting flying fish at night by the light of torches of coconut fronds. The latter makes a spectacular sight when a score or more of canoes are moving up and down in line off the reef. Women often go out deep-sea fishing, especially at night for flying fish; they paddle the canoe and look after the torches. This custom is unusual in Oceania.

The canoes of these islands are still one of the most highly developed features of their material culture. They are of the single-out-rigger type, the outrigger being normally attached to the hull by three booms, and they carry a considerable press of sail. In pre-European days no long straight planks were available in the islands, and the canoes were built up from short lengths which followed the curves of the hull and stem; moreover, timber light enough for the outrigger floats was difficult to get, and the builders relied mainly on driftwood, especially cedar brought from the American littoral by the easterly and south-easterly trades. Nowadays straight ready-dressed planks of Australian red pine are used for the hull, and the main lines of the planks are parallel to the gunwale (though until recently some of the older builders used to cut up these planks into short lengths and fit them by the old methods). Light timber for the outrigger floats is also more readily obtainable. In former days the sails were of dried and bleached strips of pandanus leaf sewn together; nowadays they are of calico. These canoes are extremely fast, one of 39 ft. in length having been timed to travel 18 sea miles in just over an hour. In sailing the outrigger is always to windward, and is so manipulated by the weight of a crew man as to keep it just skimming the surface of the water or a foot or so above. The craft

are double-ended, and as usual with such canoes do not go about when tacking but change the sail round. Great pride is taken in a canoe by its owner, and a name such as 'Tongue of Lightning' or 'Movement of Clouds' may be given to it. In olden days when a new canoe was completed a challenge was sent out to others to race, and a kind of informal regatta took place, great prestige attaching to the winner. Nowadays the primary function of the canoes is as fishing and lagoon craft. Formerly, however, much larger deep-sea vessels were built, for inter-island travel and war. These sea-going craft were 60 or 70 ft. long with a beam and depth of 6 ft. or more. With the abandonment of warfare and the prohibition by the government of voyaging between the island groups (because of the loss of life) these vessels have now gone out of use. In the extreme southerly islands of the Gilberts—Tamana, Arorae and Nikunau—where there are no lagoons, there are now no sailing craft, and the outrigger attachment of the canoes is of the Ellice islands type, from Funafuti.

Astronomy. The use of the sea-going canoes developed Gilbertese astronomy. This was not a scientific pursuit, but was concerned with navigation, and nowadays most of the old-time knowledge has been lost. The night sky was termed the 'Roof of Voyaging' and the terminology adopted to describe the position of stars followed this concept. The navigator sat in imagination under a roof, of which the eastern sky and the western sky represented the two halves, the ridge-pole being the meridian and the two roof-plates the horizons. Each half of the sky was divided into eight sections by three vertical rafters and three horizontal purlins of different altitude, and each section was further divided into two horizontal compartments. This frame of reference formed the basis of a nautical calendar, which was regulated by observation of the movements of the Pleiades and Antares. The apparent movement of the sun to the north and the south of the equator was carefully noted (at least on Butaritari); and the solstice was correlated with the sidereal calendar, the sun's journey being divided into stations or 'lands'. Observation of the moon, however, was less exact, there being no full count of the nights of the moon and of the total duration of the lunar month.

Toddy. A cultural feature which marks off the Gilbertese from their neighbours to the south and east is the preparation of toddy. This is made from the sap of the coconut palm, drawn off from the budding spathe before it is allowed to develop into flower and fruit. The sap when freshly drawn resembles ginger beer, and in this form

is drunk by the Ellice islanders, or sometimes boiled down to the consistency of molasses. The Gilbertese, however, often allow the sap to ferment, when it becomes intoxicating; indulgence in it in olden days was frequently the prelude to fighting. The preparation of toddy is a link between the Gilbertese culture and that of the Marshall and Caroline islanders; it is not practised by Polynesians.

Ocean Island

The culture of the people of Ocean island (Banaba) is similar in most respects to that of the Gilbertese, and the native tradition assigns much of the present basic social structure to a migration from Beru about eleven generations ago. There are, however, some significant differences between the Banaban and Gilbertese organizations.

While in the Gilberts a dominant factor in the social structure is the non-local clan, in Banaba it is a smaller kinship group with a more localized character. In former times each kinship group was based on a hamlet, a collection of homesteads in which in theory all the male members were descended from a common ancestor. The hamlet was the primary unit for ceremonial feasts, for giving a man his right to a position in the communal meeting house, for the tenure of land, and for ownership and control of the subterranean wells which are of fundamental importance in time of drought. Nowadays the hamlets have disappeared owing to the concentration of the people in four villages, but the old rights and privileges associated with the hamlet are still valued to some extent even by the present generation of mission-trained youths. The four villages of today, Tabwewa, Tabiang, Uma and Buakonikai (Fig. 102), represent the five ancient village districts into which the island was divided, Buakonikai having been formed recently by the government from the old districts of Te Aonoanne and Toakira. Each district formerly constituted a definite group of hamlets under a chief, and as a unit, or through its hamlets, it was organized for war, work, games and feasting. Each district also had several meeting houses, a temple and a number of stone terraces on the cliffs overlooking the sea-coast. The terraces served primarily as sites for catching and taming frigate birds, but also as residences for men practising magic and places for the training of youths. Some terraces on the west side of the island were used primarily as platforms for the large canoes of the village and in later years for trading with schooners which came for coconut oil.

The powers of the district chiefs were limited, and consisted mainly in mobilizing and guiding public opinion; a chief had the right of summoning a meeting of the people of his district and of speaking first in the meeting house. But by a traditional arrangement said to have been established at the arrival of the immigrants from Beru the chief of Tabwewa had certain privileges which amounted to a vague overlordship of the island as a whole. These included rights of welcoming strangers to the island and of having first choice of any goods they brought, the right to any porpoise or turtle stranded on the foreshore, the right to fix the season for the performance of most types of games, and a less definite right to adjudicate in general disputes, including land troubles. Nowadays the chiefs have been divested of these privileges, though they still retain considerable personal influence. Succession to the chieftainship passes to the eldest son or, failing him, to the son of the eldest daughter.

In the inheritance of land children of both sexes share. Usually the eldest son receives the largest portion, but there is no fixed rule, and the parents have far more power than in the Gilbert islands to make special appropriations to favourite children. In former times land could also be transferred from one group to another by customary methods of conveyance, in payment for services rendered or as atonement for offences committed. Feeding in time of famine, nursing in sickness or old age, or bone-setting; and murder, theft, killing of a tame frigate bird, adultery or breach of a marriage engagement by a boy were all thus compensated. The transfer of land thus operated as a social sanction tending to maintain justice and public order. But at the present time the lands of the Banabans are of little importance to them except as a source of income when leased to the phosphate commission.

Nauru

The people of Nauru live in scattered hamlets or homesteads, all of which, with the exception of those near the inland lagoon, are around the coastal belt. These hamlets are now organized into 14 districts, which are distinct governmental units, but which probably did not exist as such in pre-European times. The word used for them, *tekawa*, has been adopted from the Gilberts, where it means village. In former times there seems to have been a tendency for people occupying lands north of a line joining Ganokoro and Arijeijen (Fig. 101) to form a political unit as against the people living to the south of the line. Denigomodu, a district which lies

partly to the north and partly to the south of Arijeijen, was usually allied in time of war with Buada, the inland district, and with it took one side or the other, from policy or from kinship connections.

Each hamlet is occupied by people who are near kinsfolk. Formerly the dwelling houses were very large and accommodated several individual families, but nowadays to prevent overcrowding the administration has made it compulsory for each family to have a separate house.

Social Organization. Nauru native society is divided into a number of large kinship units or clans, of which there were 12 until about a generation ago, but of which 2 have now become extinct. The largest and therefore most important clan is now that known as Eamwit, which for many generations was the most powerful in the island through the prowess of its leaders in war. For some time Deboe clan rose to a position of great influence by defeating the leading man of Eamwit, but this clan is now only of medium size. The names of the clans suggest a system of totemism such as existed in the Gilbert islands—Eamwit is an eel; Deboe is a variety of large black fish, and so on. But it seems that even in pre-European times the members of a clan had no special interest in or regard for the animal species after which the group was named. To some extent the members of any clan tend to be concentrated in one locality, but there is no definite association of clans and districts.

The clans are matrilineal, members tracing their descent in the female line. They are also exogamous; a person is not allowed to marry a member of his or her mother's clan, though marriage with a member of the father's clan is permitted. Marriage tends to be matrilocal, a man going to set up house at the place where the parents of his bride live. In pre-Christian days polygyny was allowed to anyone who was wealthy enough in land and other goods to afford the cost of maintaining a large family. But usually only men of rank had more than one wife. A man could take a second wife only with his first wife's consent, but conversely with her husband's consent a woman might take a second husband. It appears that such polyandry was formerly quite common.

The Nauruan system of rank depends primarily upon seniority in birth. The most important man in a clan is the eldest son of the woman who traces her descent back through a line of eldest daughters to the original foundress of the clan. Such a woman and her children are known as *temonibe*, the senior members of the clan, while junior members are known as *amenengame*. The line is not an absolute one,

however; personality may help to secure for a person a rank higher than that to which he is entitled by birth, and certain *temonibe* of today owe their position to kinsfolk of junior rank who attained authority in earlier times, especially in war. Individual war leaders in the nineteenth century exercised considerable power not only in their own clan and district, but also throughout the island as a whole. Nowadays *temonibe* are still respected, and they usually own more land than most commoners do. But their position is quite distinct from that of the modern chiefs of districts, whose appointment is laid down by the government and who are chosen by the people for their general administrative ability. *Temonibe* have been chiefs, but today only a minority are such, and the Nauruans do not translate the word 'chief' by *temonibe*.

In addition to the two social classes formed by differences in seniority, there was formerly a third created by the fortunes of war. The *itsio* were a serf class of men and women who had been taken prisoner in war or who had escaped and put themselves under the protection of powerful men in districts other than their own. Today the descendants of these people are still looked down upon.

Land Tenure and Inheritance of Property. Nauru is remarkable among Oceanic communities for its developed concepts of individual ownership. Neither the clan nor the hamlet is a land-owning unit; land is owned by individuals, who have not merely rights of usufruct, as is normally the case in other islands, but can dispose of it absolutely by gift, sale or bequest as they choose. There are three main types of landed property: homestead sites; coconut land; and pandanus land. In addition the pools and lagoons in which fish are reared, as well as parts of the reef and foreshore, passages through the reef, and certain pools in groups of coral pinnacles (all valuable as fishing places) are held in individual ownership. Even waste land in the interior has its owner and its individual name. Low boundary walls of stones formerly separated one block of land from the next, but these have now disappeared in the coconut belt. As in many Oceanic communities, the ownership of trees may be separate from that of the land on which they are growing. This comes about through gifts of trees by the landowner to other people, or by permission given by him to other people to plant trees on his land; such trees can then be bequeathed away. But only coconut, pandanus and introduced fruit trees are so held; all other kinds of trees are not regarded as belonging to anyone, and even the valuable *Calophyllum* used for canoes may be cut on anyone's



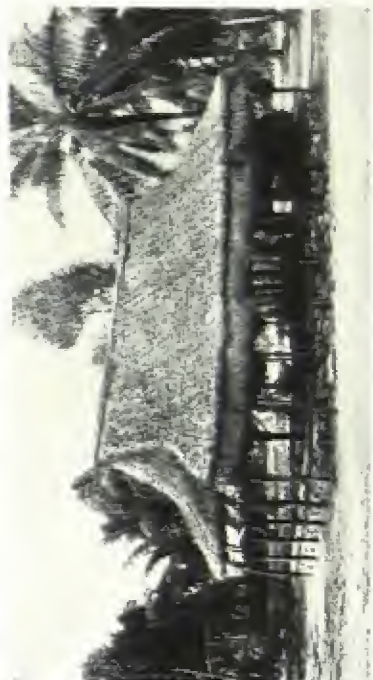
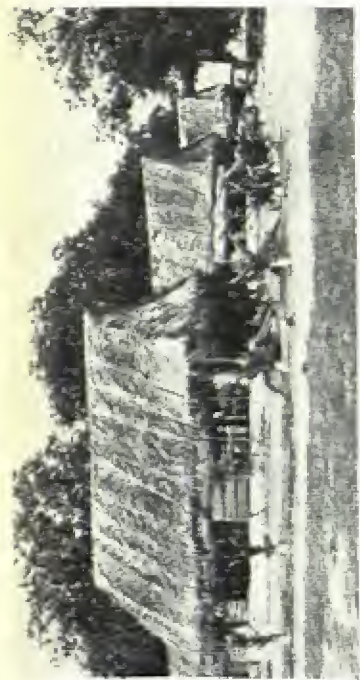
Plate 40. Western side of Nauru

This gives a general view of nos. 1 and 2 jetties projecting over the reef to deep water. The photograph was taken from the sea end of the cantilever loader (Plate 52).



Plate 41. A corner of Buada lagoon, Nauru

The lagoon is surrounded by a dense mass of coconut palms and pandanus.



Plates 42-5. Houses at Vaitupu, Ellice islands

Plate 42 (top left) shows part of the village of Fare. Plate 43 (top right) shows the use of a breadfruit of coconut fronds. Plate 44 (bottom left) shows the most modern type of house. A few houses are built on piles over the sea, as shown in Plate 45 (bottom right).

land without permission being asked or compensation given. Moreover, provided that the ownership is acknowledged, both fruit and leaves of pandanus and coconut trees belonging to others can be freely obtained.

Inheritance of property including land is governed primarily by the matrilineal principle. A married woman's land and other wealth—to which she has retained full rights as against her husband—pass normally to her daughters, the eldest receiving the major part or the controlling voice in its disposal. A married man's property goes mainly to his daughter, in similar style, but exception is made for weapons of war, and for all property associated with the sea or fishing, with which women by custom have nothing to do. Canoes and fishing tackle go to the sons, the eldest getting the largest share, while tame frigate birds are owned by the sons jointly, with the eldest exercising the main authority. If a man leaves a widow as well as children, the distribution is the same as before, but she has authority over the property during her lifetime or until she remarries. In contrast to the custom of the Gilbert islands and Ocean island, adoption was probably never common in Nauru.

Religion and Ritual. The people of Nauru are all Christians, and the great part of their ancient beliefs and ritual practices have now been forgotten except by the old people. During the nineteenth century the dominant religious cult was that of Taburig, god of thunder and war; like Bagewa, god of fish and other marine creatures, this deity was an importation from the Gilbert islands. A truly Nauruan cult was that of Eljebong, a female deity to whom offerings were made. Spirits of the dead, who could be invoked in mediumistic trances, were believed to live in a land of the dead called Buitani, a place like Nauru but larger. The keeping of captive frigate birds, a custom which Nauru shares with the Gilbert islands and Ocean island, had formerly religious associations; from about July to September there were semi-ritual contests in catching the birds.

Ellice Islands

The culture of the Ellice islanders is primarily of a Polynesian type. In pre-European times there appears to have been sufficient variation to allow the islands to be viewed as falling into three cultural areas. One was Nui, colonized from the Gilbert islands and closely affiliated with them in customs; another was the group of three northern islands, Nanumanga, Nanumea and Niutao, marked by such factors as peculiarity of canoe type and of religious cult;

the third was the southern group, in which Funafuti took a prominent place. Nowadays these variations are less marked. The cultures of the people of Funafuti and of Vaitupu, which are very similar and have been most scientifically described, may then be taken as broadly representative of the area as a whole, though there are undoubtedly local differences on other atolls which have not been recorded.

Social Organization. With the coming of British officials to the Ellice islands early in the present century it was found that one of the great obstacles to introduction of the new regime was the difficulty of collecting the people from their scattered habitations and bringing them to a central place for instruction. One main village was accordingly constituted on each atoll, with a government station, public meeting house and prison, and sufficient houses to accommodate all the people of the atoll. This was laid out in streets on a regular plan, and each house was expected to have a lime foundation which would raise the floor a foot or so above ground level. From the point of view of administration and hygiene this was an improvement, and entailed no great hardship to the people. In olden times there appear to have been two or more villages on the larger atolls, the population moving from one to the other to utilize fresh agricultural or fishing resources, or possibly for reasons of sanitation.

The modern type of dwelling house, as in the village of Fale on Vaitupu, is on the average about 24 ft. long and 16 ft. wide, with high open sides and a thatched roof of pandanus (Plates 42, 44). Screens of coconut frond mattings are put up in bad weather, and the more exposed houses have a wind-break of coconut fronds also (Plate 43). As a rule, each simple family has its own dwelling, with a smaller cook-house in addition; in former times several families shared a house. Some houses are built over the lagoon (Plate 45).

Each village has its large communal meeting house, now known by the Gilbertese term *maneaba*; formerly there were several such meeting houses, then termed *tausoa*, each associated with the members of a separate clan.

In the social structure of the Ellice islanders, apart from the simple family, the most important unit is the group of kinsfolk tracing descent in the male line from a common ancestor, and playing a prominent part in ceremonial and in control over lands. Formerly on some islands such as Vaitupu the community was divided into larger units also, of the clan type, membership being traced in the male line. There were seven such clans on Vaitupu,

each having its own meeting house, and one of the functions of these groups appears to have been to assume responsibility for defence of a section of the coast and of the approaches to the village. Unlike the Gilbertese clans, those of Vaitupu were not exogamous—there was no rule that marriage must take place with a person of another clan. Nowadays on Vaitupu the clans have lost their organization, though the names of two of them have been retained to represent the rival sides of the village assembly ground for ceremonial purposes.

Government of the Ellice island communities at the present day is primarily in the hands of native authorities set up by the administration. In former times there was a system of rank, in which a high chief—usually referred to by Europeans as the 'king'—exercised predominant power and was assisted by one or more subordinate chiefs with executive functions. These offices were not necessarily hereditary, but their holders were usually provided from a few leading families. On Funafuti the king (known by the title of *tupu*) was normally succeeded by his eldest son or by one of his brothers, a man who had previously held the office of subordinate chief. The king was not an autocrat, though he had special privileges, including those of giving sanctuary to offenders; and, though comparatively wealthy in coconut and taro lands, he was not necessarily the richest man in the community. On Vaitupu there was a further social division for routine work. The high chief and his officers were responsible for the government of the island; another group of men was responsible for order in such matters as care of paths and prevention of theft; another group was in charge of all communal work; and still another had the duty of furnishing night-watches to guard against surprise by enemy war canoes. This division of functions was an introduction from Nukulaelae. As it no longer exists, it is not possible to say how far the membership of the various groups was exclusive. The high chief might also appoint anyone as a guard against breach of his commands; the function and title of this officer have survived in the person of the modern policeman.

With the coming of Christianity the native system of government was cut across by the church organization, the Samoan pastor and the native church officials assuming positions of great authority. In their zeal for the new faith, these men often forbade old native customs, with the result that the traditional dancing and music, and games such as wrestling, foot racing, dart throwing and quarterstaff play have practically died out in most of the islands, quite apart from the ancient forms of religious ritual.

In the system of land tenure a controlling interest is exercised in theory by groups of kinsfolk, each regarding the lands of their members as property held for the common good, with the oldest or most prominent male member as a kind of trustee and adviser for the whole. In modern times, however, a tendency to differentiate the group lands on a more exclusive individual basis has emerged, as junior members of the group have submitted claims for division to the jurisdiction of the native courts. Many of the parcels of land are now very small and held in individual ownership. Title to land is normally inherited in the male line, though if a woman is the sole child in a family the lands will pass through her to her children. Unlike the Gilbertese custom that of the Ellice islanders makes little provision for conveyance of land to persons outside the kinship group. On Funafuti, and presumably elsewhere, landed property is of three types: house sites in the village; land planted with coconuts; and garden land used for the cultivation of bananas and taro. The whole island is parcelled out with boundaries marked by bush tracks, heaps of coconut husks and old trees; in the case of an atoll with a chain of islets the boundaries usually run from ocean to lagoon.

Occupations. In the Ellice islands agriculture is of a simple type, consisting mainly of the cultivation of coconuts on the open land, with that of taro and bananas in sunken gardens (p. 348). Fishing, on the other hand, is highly developed, with a great variety of methods. These include the catching of flying fish by dip net and folding net, the snaring of kingfish by noose, trolling for bonito with rod and line and a pearl shell lure, and deep-sea fishing for the castor-oil fish with a V-shaped deeply barbed wooden hook. The castor-oil fish, though weighing on an average about 30 lb., are not highly esteemed since their flesh when eaten has a pronounced laxative effect. The deep-sea fishing grounds are all well known to the experts and are named (Fig. 96). The most exhilarating form of fishing is trolling for bonito (Plates 46-48); it is the ambition of almost every young man to become an accomplished fishing captain and have the honour on a ceremonial expedition of leading the canoe fleet ashore through the surf. As with some other types of fishing, the catching of bonito is often made a communal affair, sometimes the whole village fleet going out under one command and sometimes splitting into two sections which compete against each other. Success in the fishing is believed to depend to a considerable degree on the observance of ritual taboos, and breach of them is often punished

of more careful build, with washstrakes and bow and stern covers lashed to the hull. The latter again comprise two major sub-types: that of Vaitupu and the other southern islands; and that of the northern islands, typified by the canoes of Nanumea. In the former the line of the gunwale is practically horizontal, the bow and stern covers are shallow, and the washstrakes run nearly the whole length of the hull. In the latter the upper surfaces of both bow and stern are trimmed to give the body of the canoe a general fish-shape and the stern is often forked like a caudal fin; the bow and stern covers are deep-sided and the washstrakes are correspondingly shorter. There are also minor differences in the fittings of the two types. In recent years the northern type has become popular in the southern islands as well, and on Vaitupu it is about equal in numbers with the southern type.

These canoes are usually between 20 and 30 ft. long, 18 to 20 in. deep, and have a maximum interior width of from 15 to 20 in. Trees of suitable proportions and with wood of sufficient durability for the hulls of canoes are scarce on all the lagoon islands. *Kanava* (*Cordia subcordata*), which is used in the neighbouring Tokelau group, does not here attain suitable size. In the northern Ellice islands, *fetau* (*Callophyllum inophyllum*), a heavy, brittle wood, is commonly used owing to a dearth of *puka* (*Hernandia ovigera*), which is lighter, softer and easier to work. When the northern type of canoe is built in the southern islands, however, *puka* is ordinarily used, as for the southern type of canoe. In all cases *puka* is used for the outrigger float.

Canoe building is a specialized craft and the builders in each family group have their own inherited style, by which any experienced craftsman of their neighbourhood can recognize their work at a glance. The principles of canoe construction are well understood, and devices such as an asymmetrical hull, deflected keel at bow and stern, and an inward set of the float towards the bow are used to facilitate handling of the outrigger craft, especially in a head sea.

In former times each canoe had its proper name, and songs were composed commemorating its achievements and those of its captain and crew. Nowadays these are no longer sung, but canoes drawn up on the beach are still taboo against interference by unauthorized people.

Religion. The ancient religious cults of the Ellice islanders have now completely disappeared after more than half a century of Christianity. Broadly speaking, their religion involved the worship

of a set of tutelary gods and ancestral spirits by means of invocatory prayers and offerings of coconuts, fish and valuable objects, such as soft mats and pearl-shell hooks. These gods and spirits were localized in house-temples or in sacred erections of stones, and might be represented in material form by some object such as a post of the temple, before which the offerings were spread. Each island had one or more priests primarily responsible for getting into touch with the spirits, and these men acted as spirit mediums, being termed 'vessels of the gods'. In the northern islands of Nanumanga, Nanumea and Niutao a skull cult obtained, the skulls of dead chiefs being kept on trays in the temples, with offerings laid before them. This form of ritual seems to have been lacking in the other islands.

ADMINISTRATION

The Gilbert islands, Ocean island and the Ellice islands, as the major constituent part of the Gilbert and Ellice Islands Colony, are administered directly by a Resident Commissioner whose headquarters before the war were at Ocean island. There is no Executive Council or Legislative Council; and ordinances are enacted for the colony by the High Commissioner for the Western Pacific under the provisions of the Pacific Order in Council of 1893.

The colony is subdivided into districts, each controlled by a European administrative officer. There were formerly six districts, comprising the Northern, Central and Southern Districts of the Gilberts, with headquarters at Butaritari, Tarawa and Beru respectively; the Ellice Islands District, with headquarters at Funafuti; the Fanning Island District, with headquarters at that island (vol. II, pp. 473-5) and Ocean island itself. (In addition, administrative officers are stationed at Canton, Hull and Christmas islands.) But in 1940 the Gilbert islands were regrouped into two districts only—the Northern Gilbert Islands District, comprising all the islands north of the equator; and the Southern Gilbert Islands District, comprising all the islands of the group south of the equator.

The European administrative staff in the colony is small, and much of the work of administration is done by the natives themselves. Each island with an indigenous population has its own native government operating under the European administrative officer, who does not deal with matters of native law. Each native government is presided over by a native magistrate who in session with the village elders (*kaubure*) constitutes a court. The community of each

village elects one or more *kaubure* according to its size and situation. In addition, there is on each island a chief of the *kaubure* who acts as assistant to the native magistrate and principal executive official, and a native scribe who maintains the government records, acts as local finance officer for the collection of taxes and licence fees and also does the work of postmaster. On Niulakita, where the native population consists of labourers producing copra, etc., no native government exists.

This system of local government by native bodies under the supervision of European officers operates with great success and has reached a more advanced stage than in most of the Pacific colonies. The position of the traditional native authorities under the existing regime, however, differs considerably in different parts of the area. In some cases, as in the Ellice islands, the system of chiefs has fallen into disuse; in others, as in Ocean island, the chiefs have been divested of such formal powers as they formerly possessed, though their personal influence is still considerable; in other cases still, as in the Gilberts, they appear to have been incorporated into the present system as leaders in the native governments.

The administration of Nauru, under mandate from the League of Nations, is controlled by agreements made in 1919 and 1923 between the governments of Great Britain, Australia and New Zealand, and providing for an Administrator appointed by the Australian government. Initially the arrangement was made for five years, but it has been renewed periodically. The Administrator, who is responsible to the Minister for External Territories at Canberra, is assisted by an Advisory Council consisting of two European members nominated by himself and two Nauruan chiefs elected by the people. The administration has a small European staff, comprised mainly of a head of the police, two medical officers, a director of education, a collector of customs, a surveyor and an officer in charge of the government wireless station. The British Phosphate Commission maintains a large staff; this takes no direct part in administration, but is responsible for all the control of the phosphate industry with which, by agreement, the three mandatory governments have bound themselves not to interfere.

For purposes of native administration the island is divided into 14 districts (Fig. 101). Each has a chief, elected by the people, and known to them by the English term 'chief', with status and functions quite distinct from those of persons of rank in the traditional native system. Two of these chiefs hold the position of head chief and

deputy head chief of the island. The council of chiefs meets regularly each month, and as called together by the Administrator, to discuss matters affecting the welfare of the Nauruan community.

Law and Justice

In the Gilbert and Ellice Islands Colony civil and criminal jurisdiction in general is exercised by Judicial Commissioners and Deputy Commissioners sitting in courts constituted under the Pacific Order in Council, 1893. In civil cases appeals from these courts are made to the Supreme Court at Fiji. In criminal jurisdiction all sentences of imprisonment exceeding six months or fines exceeding £100 imposed in a court of a Deputy Commissioner are submitted automatically for review before the Supreme Court of Fiji, sitting as a Court of Appeal. If in criminal proceedings the accused be charged with an offence punishable with death or penal servitude for seven years or more, the Deputy Commissioner's court has no power to try the case, which must be removed for trial before a Judicial Commissioner, who in specific cases may be the Resident Commissioner of the colony.

A code of native laws is administered in the native courts, and a European officer has no power to try cases under these laws, his function being limited to review and amendment of sentences inflicted by the native courts.

The colony is policed by an armed constabulary constituted under an ordinance of 1916, and a village constabulary appointed under the native laws. The armed constabulary consists of a European officer and about seventy native non-commissioned officers and men, most of whom are stationed on Ocean island; the strength of the village constabulary stands at about 250. The principal gaols in the colony for prisoners undergoing long-term sentences are at Ocean island, Tarawa and Funafuti, but nearly every island has its prison for minor offenders. Prisoners are as far as possible given training in some useful occupation such as carpentry or boat-building.

In Nauru all legislative functions are performed by the Administrator, who issues ordinances and regulations in virtue of the powers conferred upon him by the agreement of 1919, the Native Administration Ordinance, 1922, and other authority. He also exercises judicial functions, especially in regard to Europeans and Asiatics. An important part of the judicial work is done by the Nauruan chiefs, who by virtue of their office are magistrates of the District Court within their respective districts. They deal with minor

offences committed by Nauruans, such as failing to observe proper sanitation, riding a bicycle without a light or a bell, or being absent from a district during prohibited hours. A chief is empowered to punish by fine not exceeding 10s. or an amount of pandanus thatch or other house-building material of equivalent value. Cases demanding more severe punishment are remitted to the head chief or deputy head chief, who may inflict fines up to 20s. All offences of a serious nature must be brought before the Administrator, who also acts as final judicial authority on appeal.

The police force of Nauru in 1939 comprised a European Director of Police and nearly 50 Nauruan non-commissioned officers and constables; there is in each district a constable to assist the district chief in the maintenance of order.

Finance and Taxation

The expenditure of the colony has usually very slightly exceeded its revenue. The figures in 1936-7 were: revenue, £77,630; expenditure, £79,835. The colony has no public debt, and its assets at rather over a quarter of a million pounds exceed its liabilities by about 60 per cent. Its financial condition is therefore normally very satisfactory.

Revenue is obtained largely from import duties, a contribution by the British Phosphate Commissioners in lieu of taxation, and a royalty of 6d. per ton on all the phosphate exported, these items providing 75 to 80 per cent. of the total. Other sources of revenue are an export duty on copra, a native lands tax, and licence fees.

Expenditure is largely on the primary services of administration and on public works, but a considerable amount goes to social services; in 1937 about £12,000 was spent by the government on medical services and about £4,000 on education.

The system of taxation does not utilize income tax, hut tax or general poll tax. There is a capitation tax of £10 per annum on non-natives, but there are many exemptions, for public officials, missionaries, etc. The natives pay a land tax, assessed annually according to the productivity of each island, and paid in copra; in value it represents about 2s. per head of native population on the average for the colony as a whole.

The general revenue of the administration of Nauru normally exceeds its general expenditure by a small margin, the figures in 1940 being: revenue, £27,104; expenditure, £26,223. The territory has no public debt, and its accumulated funds amounted at the end

of 1940 to nearly £60,000. The most important source of revenue is royalty on phosphate exported, which accounted for over £20,000 in 1940. Import duty, post-office receipts and capitation tax are also significant. The capitation tax, from which there are many exemptions, is paid by male persons between the ages of 16 and 60 years who have lived in Nauru for more than two months; in the case of Europeans and Chinese the tax is paid by their employer (the British Phosphate Commissioners), and in the case of Nauruans the tax paid is transferred to the Nauruan Royalty Trust Fund. About one-half of the general expenditure is accounted for by salaries, and about one-quarter of the whole goes on medical services.

In addition to the general funds of the administration, there are also special funds. The Nauruan Royalty Trust Fund, under the control of the Administrator, is derived from a royalty of 1½d. per ton of phosphate exported, and in accordance with the provisions of the Lands Ordinance, 1921-39, is used solely for the benefit of the Nauruan people. The income of the fund is several thousand pounds a year, and a considerable part of it is spent on education, including the training of Nauruans overseas. Other objects on which money is spent include: water conservation by catchment sheds and cisterns; pumps and shower baths; manufacture of a coconut sap (*ekaratee*) emulsion for infants; films for the leper station cinema; the Nauruan brass band; and prizes for competitions in Nauruan industries. Another fund is the Nauruan Landowners' Royalty Investment Fund, accruing from royalties of 2½d. per ton paid to the Administrator and held in trust at compound interest for twenty years. At the end of 1940 the total amount in this fund was over £70,000.

There is a Nauruan Savings Bank, in which over the last ten years the accounts of 500 to 800 depositors have normally averaged about £20,000.

Land Tenure and Policy

On all the islands with an indigenous population practically all the land belongs to the natives. No sale of lands to non-natives is permitted in the Gilbert and Ellice Islands Colony, but subject to the approval of the Resident Commissioner leases of land may be granted for parcels not greater than 5 acres in extent and for a period not exceeding 99 years, while in special cases larger leases may be obtained with the sanction of the High Commissioner. The purchase value of good coconut-bearing land in the Gilbert and Ellice groups,

as between natives, has by convention become established at about £12 per acre, while the annual rental of such lands leased by Europeans is about £3 per acre. On Ocean island and on Nauru special conditions obtain owing to the phosphate working; a fixed sum per acre is paid to the natives, who also receive compensation for the removal of coconut palms and for other disturbance, and a small tonnage royalty on the phosphate shipped. This royalty is paid into a trust fund for their benefit. In due course, when the phosphate is exhausted, they resume utilization of the land.

For the native lands the system of tenure described earlier (pp. 326-36) still holds. But considerable confusion in Gilbertese land ownership arose after the British protectorate was proclaimed in 1892, since in many cases this interrupted a local land war and left the issues still in debate between the parties. The first land registers, compiled between 1893 and 1895, were unable to clarify the situation, and in 1919 a Native Lands Commission was set up to determine titles according to local usage and to secure their registration. Owing to shortage of staff and the large number of holdings to be considered, the work of the Commission was accomplished slowly. Land registers were established on Ocean Island, Butaritari, Little Makin, Marakei and Abaiang. After this the Commission practically ceased to function till 1935; from then until the outbreak of war some progress was made again. In 1939 a Chief Lands Commissioner was appointed, and in 1941 a Native Land Court was set up to deal with the simpler land claims.

SOCIAL SERVICES

The administrations of the Gilbert and Ellice Islands Colony and of Nauru operate both medical and educational services, but the missions and the British Phosphate Commissioners (on Ocean island and Nauru) also play a substantial role.

Medical Services

In the Gilbert and Ellice islands the most serious disease is tuberculosis, which is responsible for about 30 per cent. of the deaths. Yaws, bacillary and amoebic dysentery are present, but are not severe. There are few lepers, and those recognized are sent to the settlement at Makongai, Fiji. Malaria is absent from the islands, but another mosquito-borne disease, filariasis, occurs. It is almost

unknown in the Gilberts, but is widespread in the Ellice islands, especially on those which are not atolls and on which consequently the denser vegetation gives more protection to the *Aedes* mosquito. Epidemic-introduced disease occasionally has very serious effects; in 1936 a measles epidemic was regarded as being responsible for about 1,000 deaths.

The government of the Gilbert and Ellice Islands Colony maintains a staff of several European medical officers, about 10 native medical practitioners and about 50 native dressers. Some students from the colony have been trained at the Central Medical School, Suva, while a few Ellice islands girls have been trained as nurses in Samoa. At Tarawa, which is the headquarters of the medical service, there is a central hospital, and there is also another principal hospital on Funafuti, while there are simple island hospitals on almost every atoll. These island hospitals are a charge on the native governments' funds, though their equipment is found primarily from colony funds. On Ocean island the British Phosphate Commissioners maintain hospitals for the different sections of the population.

In Nauru there is no malaria, and with the exception of filariasis most of the other ordinary tropical diseases have been eliminated or greatly reduced in incidence. A leper station and a leper clinic deal with the considerable number of leprosy cases. In recent years an ante-natal clinic and infant welfare clinics have been established. There are two hospitals, one maintained by the administration for Nauruans and the other by the British Phosphate Commission for its employees. In addition to the European medical officers, a Nauruan native medical practitioner was appointed in 1939 and another in 1941, thus linking the medical work more closely with the people. These Nauruan practitioners were trained at the Central Medical School, Suva. The administration spends annually from general revenue about £6,000 to £7,000 on medical services, mostly for the benefit of the Nauruans.

Education

The Gilbert and Ellice islands administration maintains two native boys' boarding schools, the King George V School at Tarawa and the Ellice Islands School on Vaitupu. A school for native boys on Ocean island has been maintained since 1920 from phosphate royalties. The senior boys from this school pass the final years of their instruction at the Tarawa school. Instruction of the European children on Ocean island was begun in 1928, the cost of the school

being borne jointly by the government and the phosphate commission.

In 1937 the total cost of education was estimated at 2s. 3d. per head of population. About 1922 an interesting experiment was begun with the pupils of the Tarawa school, demonstrating incidentally the strength of kinship ties in the Gilbert islands. It was impossible to obtain enough food for the boys on Tarawa itself, and imported food, whether foreign or native, was very expensive and difficult to get. Hence an appeal was made to clan feeling, the clan of each boy on the island from which he came being responsible for supplying him with sufficient home-grown food.

The mission schools combine ordinary education with religious instruction. The London Missionary Society, in addition to training schools for teachers at Beru and Abaiang, and three intermediate schools, maintained in 1937 94 village schools, with nearly 3,000 pupils. Rather more than half of these schools receive grants-in-aid from the government. The Sacred Heart mission has training schools at Abaiang and Abemama, an intermediate school at Butaritari, and nine convents; it also maintained in 1937 99 village schools with about 2,000 pupils. Only a few of these schools receive grants-in-aid. In association with their work, each of the missions has a printing press and publishes a small periodical.

In Nauru the system of education has been controlled since 1923 by the administration. It was thoroughly revised a few years before the war in order to relate it more closely to the interests of the Nauruan people and their changing needs. In 1937 a Native Educational Committee was set up for this purpose, and apart from the Director of Education (a European) all its members, including a woman, were Nauruans. More attention was then paid to practical training, on the one hand, and to traditional Nauruan culture on the other.

There are ten schools on the island. A primary school for European children follows the standards of the Education Department of Victoria. Seven primary schools for Nauruans include a special school at the leper station, and a school run by the Sacred Heart mission; the others are administration schools. Education in these schools is bilingual, with increasing attention to English in the higher grades. There are two secondary schools—the Moure school for boys, with attention paid to carpentry, boat-building and canoe-building, cycle and motor repairs, and gardening; and the Orro school for girls, with attention paid to nursing, mothercraft, sewing

and native crafts. Special technical training has been given to a small number of Nauruans at Geelong, and medical training to a few others at the Central Medical School, Suva.

Funds for education of the Nauruans are provided solely from the Nauruan Royalty Trust Fund, which receives its revenues from the phosphate industry. The fund is controlled by the Administrator, but the council of chiefs may make suggestions to him about its expenditure. In 1940 expenditure on education from the fund was approximately £1 14s. per head of Nauruan population.

Missions

The history of missions in the area and their role in social services have already been summarized. They play an important part in the life of the islands, and at the present day a major share in religious instruction and education is taken by the native people themselves, under guidance by relatively few Europeans or leaders from other Pacific areas. In 1940, for instance, the Gilbert Islands and Nauru Mission (London Missionary Society) had only 9 Europeans, and the number of Samoan pastors had decreased to only 4, whereas there were 39 ordained Gilbertese ministers in the field, with 56 trained and 32 untrained Gilbertese teachers.

(For Bibliographical Note see Chapter IX.)

Chapter IX

GILBERT ISLANDS, ELLICE ISLANDS, OCEAN ISLAND AND NAURU (*cont.*)

Economics: Ports: Communications: Nauru: Ocean Island: Gilbert Islands: Ellice Islands: Bibliographical Note

ECONOMICS

Despite the wealth of Nauru and Ocean island, the economic resources of the area as a whole are very limited. Mineral deposits, except for phosphates, are absent from such coral formations, and the soil is too poor to allow of any great agricultural development. The natives practise primarily a subsistence economy, based upon a restricted agriculture and fishing; the cash needed to buy the simple range of European consumers' goods which they use is obtained mainly by the sale of copra, and to some extent by working for wages. On Nauru and Ocean island they are in a special position owing to their receipt of royalty on phosphate exports. On Nauru, out of a total area of 5,263 acres, 3,542 acres are phosphate-bearing land and 985 acres are 'coconut land'; the latter represents nearly all the land used by the Nauruans for agriculture (Fig. 100).

Agriculture

The native methods of cultivation are not elaborate. Little attention is given to the coconut palms beyond planting the sprouting nuts and clearing away the shrubs around. *Alocasia*, the other main cultivated food plant, receives more care. It requires much moisture, and as irrigation is almost impossible in these streamless islands the natives have adopted a method which conserves at least some precipitation, and utilizes the sub-surface moisture. In the Gilbert islands the plants are grown in trenches from 8 to 12 ft. deep and from 10 to 20 ft. wide. The same method is followed in some of the Ellice islands, but in others, such as Funafuti and Nukulaelae, where swampy areas exist, the excavations are much larger; they are carried down to reach permanent swamp level, which varies from about 6 to 12 ft. below the surface of the ground. On Funafuti at the end of the last century the garden area occupied 10 or 12 acres, irregularly divided into blocks of 2 acres or more by embankments,

representing the original level of the land, and 3 or 4 yd. in breadth. These served as paths, and were usually planted with breadfruit or other useful trees. The cultivating tools were formerly a kind of mattock with a turtle-shell blade and a long-handled shovel with a wooden spoon-shaped blade. These have now been abandoned in favour of European spades. As the plants grow they are 'hilled up' with soil to a depth of 2 or 3 ft. and a mulch of leaves is applied, thus conserving additional moisture. No manure is used in cultivation.

In Nauru, where coconut and pandanus were formerly almost the sole food plants, the agricultural range has been considerably enlarged in recent years. Bananas, pineapples, pumpkins, beans, breadfruit, papaya, tomatoes and other fruit and vegetables have been introduced, and some have done well, though the great variations in rainfall and the lack of natural pollinating agents have hindered development in some cases. Bee colonies have been installed in an attempt to overcome the latter difficulty. Annual planting of pandanus trees under administration stimulus has resulted in flourishing young plantations all round the island. Animal husbandry is on a small scale, but the introduction of pure-bred boars in 1939, under the care of a committee of chiefs, has been very successful in improving pig-breeding.

Copra

The amount of copra produced on Nauru is negligible. In the Gilbert and Ellice islands its preparation is almost entirely in native hands, the only European plantation there being on Niulakita. (Other plantations in the Fanning Island District contribute to the export from the colony.)

In 1928 it was estimated that the total area under coconuts in the whole colony was about 20,000 acres, though the extensive use of the nuts for food means that only about four-fifths of the product is available for copra, of which the average export in a year of normal rainfall is about 6,000 tons. The average yield from a coconut palm is 50 or 60 nuts a year, but they are apt to be small, and 5 nuts are needed to prepare 1 lb. of copra. In 1925 the average yield per acre was estimated not to exceed 8 cwt. of copra—a low return in comparison with the 18 cwt. from Samoan plantations. The reason for this is partly the poverty of the soil, but partly also the difficulty of inducing the natives to realize that crowding their palms together does not increase the yield. Attempts have been made to improve the situation by getting the people to thin out their palms and to

plant them at wider intervals, but they have met with only limited success. Local droughts have been one primary cause of fluctuations in production (as in 1926-7 and 1937-8), and disease has occasionally been another (as in the measles epidemic of 1936).

Difficulties have also occurred with regard to the marketing of the copra. The tendency of the native producers was to break out the flesh from the nuts in small pieces, which fetched a lower price than the whole flesh, since there was more fermentation and formation of free fatty acids on the margins of small pieces. The natives were encouraged by the administration to prepare the copra whole, and the trading firms were invited to give a higher price for such copra, or alternatively to refuse the broken product. After negotiation, however, they stated that they preferred the small copra, since it could be more closely packed and was more economical to transport to the overseas markets. The concern of the administration with the industry, the sole one of any importance to the Gilbert and Ellice islands proper, was further shown by regulations in 1930 to prevent the sale of wet copra, or copra made from green nuts. An attempt to secure better prices for the native producer was also made by stimulating co-operative marketing. The copra was collected at central depots and sold from there in bulk at traders' rates to the vessels that called. But the scattered island groups, the poor communications and the inertia of the natives themselves rendered such organization difficult.

All these efforts were hampered by the heavy fall in prices in the depression from 1930 onwards. Whereas about 1925 the price paid by the traders to the native producers was rather more than £9 per ton, and they themselves received from £12 to £14 per ton from the shipping firms, by 1933 the respective prices were £5 10s. and £6 10s. per ton. By the beginning of 1935 they were as low as £2 and £2 10s. per ton. The result was some restriction of output—though the official figures are not always in agreement as to quantities. Moreover, the natives, unable to grasp the intricacies of the world economic system, felt that they were being exploited by the traders, both by being paid so little for their copra and by being charged more for the trade goods they bought, the price of these having risen. Consequently they took small pains to tend their coconut palms and to engage in fresh planting. Towards the end of 1935 copra prices began to rise again, however, and a renewed interest was taken in the co-operative marketing societies, which are now in a fairly flourishing condition.

Phosphate

The greatest source of wealth for the central Pacific area lies in the extensive phosphate deposits on Nauru and Ocean island. About the middle of the nineteenth century phosphate had been found on islands in the Phoenix group as well as on Baker and Howland islands adjacent to them, and had been worked by an American company to a limited extent. In 1884 a British firm, John T. Arundel and Company, began to re-work the deposits for the low-grade material left by the Americans, and continued operations for some years (vol. II, pp. 467-70). About 1895 a small phosphate deposit on Niulakita in the Ellice group was worked by an American from Samoa. But towards the end of the century it appeared as if all the central Pacific phosphate resources had been exhausted.

Late in 1899, however, Nauru and Ocean island came to notice in a dramatic way. A piece of rock used for some years as a door-stop in the Sydney office of the British firm—which by then had been absorbed by the Pacific Islands Company, Limited—and thought to be fossilized wood, was tested by Mr. A. F. (afterwards Sir Albert) Ellis, and was found to be phosphate rock of the highest quality. It came from Nauru. Ocean island was known to be of like formation to Nauru, and investigation confirmed the existence of extensive deposits on both islands. Their wealth had gone unsuspected, since the phosphate was of a harder, more compact type than the ordinary soft deposits known in the Pacific till that time. Moreover, all the deposits hitherto known were on the low-lying coral islands, and elevated coral islands such as Nauru and Ocean island had been regarded as barren from this point of view.

Exploitation of Ocean island began in 1900, and production rose rapidly from 13,350 tons in 1901 to nearly 108,000 tons in 1905. But owing to shipping difficulties the supply was insufficient to meet the rapidly increasing demands from the fertilizer manufacturers, and work was begun on Nauru in 1906. Nauru production was only 11,630 tons in 1907, but soon rose. From 1908 to 1913 Ocean island shipped 1,020,800 tons and Nauru 630,656 tons. During the period from 1914 to 1920, when trade was much dislocated, the amounts were 676,700 and 566,100 tons respectively. In 1916 shipments from Nauru exceeded those from Ocean island for the first time, and the lead was maintained until the present war.

In 1920 the Nauru interests of the Pacific Phosphate Company (which had replaced the Pacific Islands Company in 1902) were acquired under the terms of the Nauru Agreement by the govern-

ments of the United Kingdom, Australia and New Zealand. The company's interests in Ocean island were also taken over at the same time. The sum paid was approximately £3½ million sterling, this being provided by the respective governments in the proportion of 42 per cent., 42 per cent. and 16 per cent. The phosphate industry of both islands was then run on a commercial basis by the British Phosphate Commissioners, a board consisting of three members, each representing one of the countries concerned. Development of the two islands proceeded rapidly, being stimulated by an increased

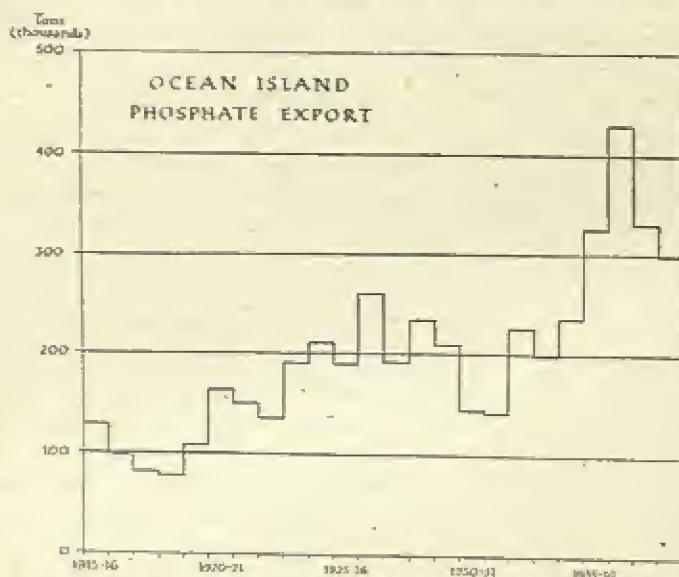


Fig. 97. Phosphate export, Ocean island, 1915-6 to 1938-9

The graph shows quantities to the nearest 5,000 tons. Based on: (1) Colonial Office *Annual Report on the . . . Gilbert and Ellice Islands Colony* for 1919-20 and subsequent years (London); (2) *Pacific Islands Year Book*, p. 160 (Sydney, 1942).

demand for phosphate after the war of 1914-18. Improved equipment was installed, including a cantilever loading plant at Nauru.

But difficulties had still to be met. The export of phosphate depends to a considerable extent upon weather conditions—a drop in the Ocean island figures in 1927-8, for instance, was due to interruption of loading by heavy gales. From 1930 to 1932 the economic depression affected the market, and exports from both islands fell away practically to the level of ten years before. As the market expanded again, however, exports rose once more. By

1936-7, when phosphate consumption had risen in Australia and New Zealand by nearly 300,000 tons in two years, the plant at Ocean island as well as that at Nauru was taxed to full capacity. Average export in recent years has been rather more than 300,000 tons per annum from Ocean island (Fig. 97) and about 700,000 tons per annum from Nauru (Fig. 98). Increased facilities at Nauru kept the Ocean island export low, but destruction of the loading plant at Nauru by a German raider in December 1940 necessarily made special demands upon Ocean island.

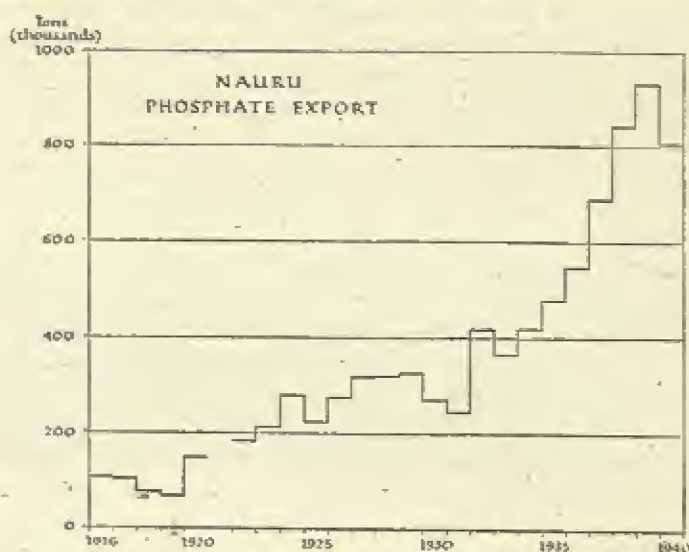


Fig. 98. Phosphate export, Nauru, 1916-40

No data have been obtained for 1921. The graph shows quantities to the nearest 5,000 tons. Based on data from *Commonwealth of Australia Report to the Council of the League of Nations on the Administration of Nauru* for 1920 and subsequent years (Melbourne to 1927; Canberra from 1928).

Owing to the irregular nature of the bed-rock, no definite figures of the quantity of phosphate still remaining on the islands have been obtained. But a conservative estimate some years ago put the deposits at about 100 million tons, of which those on Ocean island represent about 20 million tons. On the level of output in recent years this may mean from about 75 to 100 years' production still in sight. The quality of the phosphate is extremely high. A common analysis of that of Ocean island gives about 88 per cent. of calcium phosphate, with less than 3 per cent. of calcium carbonate, and less than 1 per cent. of oxides of iron and aluminium (the last being undesirable consti-

uents). Phosphate from Nauru shows about 85 per cent. of calcium phosphate and about 5 per cent. of calcium carbonate.

The Ocean island phosphate deposits show a variety of formation and structure. But a great proportion is rock phosphate, which renders quarrying operations difficult, since the large masses have to be broken up by explosives and the boulders reduced with hammers to a suitable size for the gyratory rock-breakers to deal with. Much of the material has to be extracted from among the pinnacles of coral limestone or dolomite which rise like teeth from the bed-rock (cf. Plate 49); as phosphate deposits of good quality go down to a considerable depth, mining then requires much care, owing to the tendency of pinnacles to crumble at the base and fall. Quarrying is frequently carried on at a depth of 45 ft., and the deepest excavation reaches to about 65 ft., though here the deposit is very narrow. The pinnacles are disturbed as little as possible, though some are blasted away to permit the entry of tramlines to follow the face of the deposit. On the lower levels, small cranes are used for lifting the phosphate, and recently long-span cableways and steam-shovels have been introduced. On Nauru the deposits are looser and more friable, and fewer varieties of rock are found. The depths are not usually so great as on Ocean island, though 25-30 ft. is often reached, and in general extraction is less arduous.

The phosphate must be shipped in dry condition, and in the early years of working the material was sun-dried. Later, mechanical dryers of a rotary type were introduced and new crushing, drying and storage units were completed with special electrical precipitators for collecting the dust, which previously had been a serious problem. Owing to the great depths of water off the islands, vessels cannot anchor to load, so a system of deep-sea moorings was instituted. At Nauru a cantilever conveyor (Plates 51, 52) for direct loading was installed in 1930, with a capacity of 1,000 tons per hour. But at Ocean island, where the reef was found to be unsuitable for such a structure, surf-boats are used to convey phosphate from a cantilever jetty to ships (Plate 53).

Fishing

Fishing is an important occupation throughout the area, though the entire product is consumed locally. There has been a great increase in Nauruan sea-fishing in recent years, helped by the stimulus given to canoe construction by annual competitions. The native owners have fitted outboard motors to a number of their



Plates 46-8. Bonito fishing, Vaitupu

In Plate 46 (top), a canoe is being paddled out to the fishing grounds, with the bonito rod projecting over the stern. Plate 47 (middle) shows fishermen at work among a shoal. In Plate 48 (bottom) the canoes are being drawn up on the beach on their return, and the catch is being borne off.



Plate 49. Part of a worked-out phosphate field, Nauru
Removal of the phosphate exposes the limestone pinnacles. Engine sheds of the light railway are in the background. The photograph was taken in 1938.



Plate 50. Breakwater, Nauru
The breakwater helps to protect the boat harbour from the heavy seas which are often experienced here. Note the typical dress of the Chinese workman at the right.

canoes, and have thereby secured greater catches of fish caught with a spinner, such as bonito and 'yellow-tail'. The abundance of the 'castor-oil fish' (*palu*, *Ruvettus pretiosus*) in the Ellice islands waters has led to the suggestion that a fish-oil industry might be started, but this has not yet been attempted.

A type of fishing characteristic of Nauru is the taking of a fish called *ibiya* (*Chanos chanos*) after it has been reared in the brackish lagoons inland. These fish are greatly esteemed and are not normally sold, as are sea fish. The large inland lagoon, Buada, and two smaller ones in Iyu are subdivided into ponds by ridges of piled coconut fronds in the former case and coral boulders in the latter; in these ponds, which are owned individually, the *ibiya* fry are reared after having been scooped up on the reef and fed for some time in nursery pools. When the fish have grown to a length of 15 in. to 2 ft. or more they are taken in a drag net, often by a group of people invited by the owner of the pond because they have helped him to stock it.

Other Production

Other forms of commercial production in Nauru and the Gilbert and Ellice islands are practically negligible. Pearl shell has been found in the lagoon of Onotoa, but cannot be worked by naked divers owing to the presence of ferocious eels, which have been responsible for some loss of life.

The mats plaited from pandanus leaf by the native women are of good quality, those of the Gilbert islands depending on their fine texture and finish, and those of the Ellice islands on their strikingly coloured designs. Hats of a Panama type, and fans, baskets and bags of fine quality are also plaited and exported in small quantities from the Gilbert and Ellice islands; but the lack of an adequate market checks expansion of the craft. About 1927 the London Missionary Society experimented in the manufacture of coir products from coconut fibre, and also introduced knitting machines to Beru; but neither venture succeeded, possibly because of the economic depression which soon followed.

Indentured Labour

For many years the Gilbert and Ellice islands provided labour for plantations in other parts of the Pacific, and even nowadays Gilbert islanders work under contract on Fanning and Washington. But development of the phosphate industry on Ocean island and Nauru provided a local labour market. From the beginning of the exploita-

tion of Ocean island, in 1900, a considerable number of Gilbert and Ellice islands natives have been employed, and have given satisfactory service, especially in boat work. Some local Banaban (Ocean island) labour has also been employed. But the islands did not provide a sufficient personnel for the varied tasks required. With the opening up of work on Nauru in 1906 labourers from China and from the Caroline islands were brought in, and in 1908 Japanese coolies and mechanics were introduced on Ocean island. In 1920, however, after the allocation of the mandates, the Japanese authorities caused the labour of their own nationals and of the Caroline islanders to be withdrawn, and Chinese labour from Hong Kong was recruited to replace it.

In recent years the number of Chinese employed on Nauru has varied between 1,000 and 1,500. By 1937 there were on Ocean island about 780 Chinese mechanics and coolies, with 520 Gilbert and Ellice islanders; about 90 Banabans also provided labour.

The Chinese, who are on a three years' agreement, are not allowed to bring their womenfolk; their wages range from £2 to about £6 per month. The Gilbert and Ellice islanders are recruited for 18 months' service, and one-third of them are accompanied by their wives and children; their wage is 32s. per month, with a bonus of 8s. per month for satisfactory work, and they have free quarters and rations in addition. The Banabans, who are regarded as casual labourers though most of them are in regular employment, live in their own villages; they receive 4s. per day. The various sections of labourers tend to keep apart socially, but with the exception of some friction on Ocean island, which developed into a riot in 1925, there has been no labour trouble of moment.

Trade

The internal trade of the various islands is very small and no data are available concerning it. Exports include a small quantity of sharks' fins, native mats, hats and baskets from the Gilbert and Ellice islands. But the only significant items are phosphates from Ocean island and Nauru, and copra from all the islands except Nauru. Figs. 97, 98, 99 show the fluctuations in the export of these two major items from 1916 onwards. (The graph of copra exports gives the position for the whole Gilbert and Ellice Islands Colony; the amounts include copra from Fanning and other islands of the Eastern Pacific—vol. II, pp. 478-99 *passim*—since this is not usually shown separately in the official returns.)

The largest market for the phosphate has always been the farming industry of Australia and New Zealand, the former normally taking 60-70 per cent. of the product and the latter about 25 per cent. Because of freight charges the United Kingdom, though a large shareholder in the operations of the British Phosphate Commission, has been able to take only a small quantity of the phosphate. Finland has also taken a little. In recent years the Japanese market for agricultural phosphate has increased considerably, and Japan's absorption of the Ocean island product rose from about 3 per cent. of the total export in 1932-3 to about 13 per cent. in 1936-7. She also increased her small share of the Nauru export to about 5 per cent. in 1940.

Ocean island phosphate represents by far the largest item in the

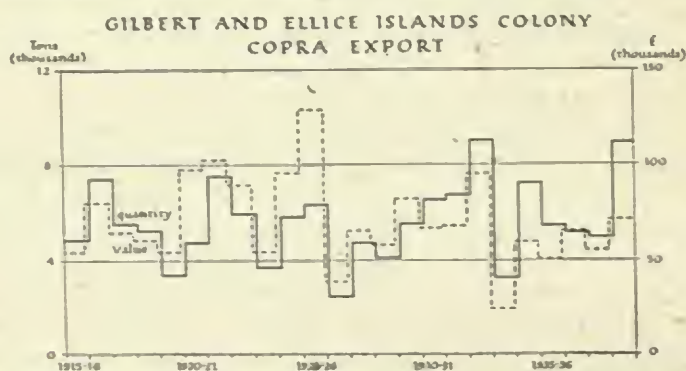


Fig. 99. Copra export, Gilbert and Ellice Islands Colony, 1915-16 to 1938-9

Based on: (1) Colonial Office *Annual Report* from 1918-19 to 1937; (2) *Pacific Islands Year Book*, p. 160 (Sydney, 1942).

export trade of the Gilbert and Ellice Islands Colony, its contribution varying from two-thirds to sometimes nearly nine-tenths of the total value.

But the copra export is still of great economic importance because of the support it gives to the native population of the islands. The effects of price fluctuations have already been described (p. 350). The majority of the copra export goes to the United States and Mexico, though small amounts from the Gilbert islands have been taken by Australia; in recent years a little has gone to the United Kingdom and to Japan.

Both the Gilbert and Ellice Islands Colony and Nauru have a favourable balance of trade, the excess of visible exports being due

in each case to phosphate. In both cases the islands are largely dependent upon imports for their essential requirements, even for foodstuffs, which usually amount to between 20 per cent. and 30 per cent. of the value of the total goods imported. Other major items are machinery, hardware and oil fuel. Some of the foodstuffs come from New Zealand, but the bulk, together with building materials, coal and some hardware and tobacco, are imported from Australia, which is the chief supplier, with 40-50 per cent. of the import trade of the colony in the recent years before the war and 45-65 per cent. of that of Nauru. The United Kingdom, which supplies clothing, machinery and some hardware, is normally second in importance, with 20-25 per cent. of the import trade of the colony and about 15 per cent. of that of Nauru. The United States, contributing some tobacco and some oil, and the Netherlands Indies, contributing oil fuel, have also a substantial share in the import trade, while smaller amounts of goods have been imported from China and Japan.

Before the war there were three trading companies operating in the islands: Burns, Philp (South Sea) Company, with headquarters at Tarawa; W. R. Carpenter and Company (who acquired the interests of On Chong and Company, though the name of the latter firm was retained), with headquarters at Butaritari; and a Japanese company, Nanyo Boeki Kaisha, with headquarters at Jaluit in the Marshall islands and a station at Butaritari, to which they were restricted by the government. In addition, the British Phosphate Commission maintained a store at Nauru, primarily for their employees, and there were native co-operative societies engaging in copra buying and some retail trade at Nauru and on a number of the Gilbert islands. These societies worked primarily through the large firms for shipping and bulk purchase of goods.

An agency of the Commonwealth Bank of Australia (Savings Bank Branch) was established on Ocean island, and another on Nauru. There were no other banks, but the principal trading firms acted to some extent as bankers. In the Gilbert and Ellice islands natives could deposit their cash with any government officer for safe keeping and operate upon the deposits in the manner of a savings bank account.

Australian currency is normally used in the islands, though sterling is also used, and before the war taxes, duties, fines and wages in the Gilbert and Ellice islands were payable in this currency.

Tariffs in the area are moderate, since both Nauru and the Gilbert and Ellice Islands Colony receive much of their revenue from

royalties on phosphate. Export duties are levied on copra in the colony. There are small import duties in Nauru, and import duties are levied on most articles brought into the Gilbert and Ellice islands. The colony gave preference to British goods in 1934, and the duties ordinarily paid are 12½ per cent. preferential and 25 per cent. general, *ad valorem*.

PORTS

There are no large ports in the area, and except at Ocean island and Nauru facilities for handling cargo are restricted to piers or jetties serving only small craft, usually lighters or boats. The chief ports in the Gilbert and Ellice islands proper before the war were Butaritari (Fig. 104) and Tarawa (both were ports of entry for overseas vessels); their facilities and those of the remainder of the group are described later in the section dealing with individual islands.

Here Ocean island and Nauru alone are discussed. (Facilities are described as prior to December 1940, when the installations on Nauru were shelled by a German raider; further change is probable on both islands as a result of the Japanese occupation.) There are no proper harbours at these islands, and owing to the steepness of the reef edge there is no anchorage for large vessels. For these a system of deep-sea mooring buoys has been laid down.

Ocean Island

At Ocean island, in Home bay, there are two large mooring buoys, each moored with a single heavy anchor to seaward in about 200 fathoms and supported on the shore side by two spans of wire and chain to anchors embedded in the reef, these spans being supported by smaller buoys. Each mooring buoy has a large wooden fender. Smaller buoys lie between the two larger buoys and the shore, and provide the best berth for a vessel not more than 265 ft. long. A trot with small buoys for lighters is near the loading jetty. A small boat harbour has been blasted out of the reef near the south end of Home bay, with skids, electric winches and other facilities for hauling up the lighters. Phosphate is loaded into the lighters from a steel cantilever pier (Plate 53) constructed about 1930, while cargo is landed on to an older steel pier (Plate 54) to the north-west and on to a short jetty in the boat harbour. There is also a boat channel at Tabwewa, now used only by canoes.

Ocean island is one of the ports of entry into the colony. Normal

facilities include seven launches and 35 lighters; about 800 tons of New South Wales coal (supplied in baskets at the rate of about 100 tons per day); and a small quantity of oil fuel. Ordinary fresh water is scarce, but there is a distilling plant capable of producing 4,000 gal. per day, while the numerous concrete cisterns have a total capacity of 3,000,000 gal. Small repairs may be effected in the machine shop and foundry, where castings up to 200 lb. are made and 25-h.p. Diesel engines for launches are built. A diesel-engine power plant generates 2,400 b.h.p.

Nauru

Facilities at Nauru are in general similar to those at Ocean island, though rather more elaborate. There are several mooring buoys and two piers (Plate 40), the property of the British Phosphate Commissioners, off Yangor on the west side of the island. One of these piers, that to the north, is used as a landing jetty for cargo; adjoining it on the south side is a boat harbour (Plate 50), blasted out of the reef, for the use of launches and lighters. The second pier, formerly used for loading phosphate, has been superseded by a cantilever loading plant of open pier construction (Plates 51, 52), built 1927-30.

The cantilever loader has a pair of immense swinging arms built on massive pillars near the edge of the reef, and projecting 172 ft. from the centre pivot to reach deep water (200 fathoms). Extension booms 28 ft. long give a total overhang of 200 ft. The arms and booms carry wide rubber belt conveyors and swing easily from hatch to hatch of a vessel, which once moored broadside-on remains in position till loaded. The whole plant is electrically driven and controlled and has a maximum loading capacity of 1,000 tons per hour. The loading system, like that of Ocean island, can be used only in fine weather.

Additional equipment at Nauru includes a boat and launch shed with skids running down to the boat harbour, 4 launches and 30 lighters, a condenser house, a machine shop and foundry, and truck lines connecting with the main railway system. All machinery is electrically operated from generators driven by diesel engines. In normal times a limited amount of meat, vegetables and bread can be obtained, but no fresh water. A small quantity of coal and oil fuel is kept for local use.



Plate 51. Cantilever pier, Nauru

One slewing crane is swung out in the loading position, though in this instance an oil tanker is being discharged.



Plate 52. Cantilever pier, Nauru, from the sea

The view, taken end-on, shows the slewing cranes swung back against the mooring masts. The photograph was taken in 1931.



Plate 53. Cantilever pier, Ocean island
This, known as no. 4 jetty, is used for loading phosphate into lighters.



Plate 54. Discharging oil, Ocean island
The vessel is moored a little distance off the reef, and the pipe-line led ashore over lighters to the pier. The quarters for native labour can be seen in the background.

COMMUNICATIONS

The islands lie between the main north and south trans-Pacific trade routes, and communication with the outside world by sea is relatively infrequent. There are no passenger lines, and no tourist traffic exists. Moreover, the scattered nature of the various islands and groups does not allow of easy communication between the major sections.

The details below describe the situation before the outbreak of war.

Shipping

Ocean island and Nauru lie roughly equidistant between Australia and New Zealand, and maintain shipping connections chiefly with these Dominions by means of vessels owned or chartered by the British Phosphate Commissioners. The Australian port is generally Melbourne, but phosphate vessels occasionally sail from Sydney and Newcastle also. A few sailings each year are made to and from New Zealand. An average voyage to Melbourne takes 10 days, and to Auckland 9 days. Communication between Ocean island and Nauru is fairly frequent. There is no regular shipping between Ocean island and the Gilbert and Ellice islands, and the latter rely mainly for mails on the Government vessel *Nimanoa* (a Diesel-engined ketch of 156 tons gross), which makes irregular trips. Occasional communication is provided by vessels coming chiefly from New Guinea to Tarawa and Butaritari to collect copra. A small Japanese vessel from Jaluit visits Tarawa and Butaritari three times annually, the London Missionary Society's auxiliary schooner *John Williams V*, visits the Gilbert and Ellice islands three times a year from Suva, calling at practically all the islands, and a British naval vessel from the New Zealand station usually makes an annual tour there. Communications between the Ellice islands and Fiji are supplemented by a small trading vessel of the Burns, Philp company, which makes two trips a year between Funafuti and Levuka. Inter-island traffic in the Gilbert and Ellice groups is maintained by small craft engaged in the local copra trade on behalf of the two major trading firms with stations there.

Communication between the Gilbert and Ellice islands and other islands of the colony in the Eastern Pacific is restricted to occasions when labour for the copra plantations of Fanning is recruited, at

intervals of two or three years, or when trips are made irregularly in connection with the colonization scheme for Gilbertese in the Phoenix islands.

Railways

There are only two railways in the area, on Ocean island and on Nauru. That on Ocean island is of 2 ft. gauge, and has small steam locomotives handling the trucks of phosphate. There are about 4 miles of line, and electrically operated winches lower trucks from the upper levels to the main line which runs along the west and south-west of the island. On the main line the British Phosphate Commission also runs a small motor train service, connecting the European settlement of Tabwewa in the north-west with the main settlement of Uma in the south-east. In the phosphate fields there is also a system of long-span cableways, and there are numerous tramlines following the working face. The railway on Nauru, with about 5 miles of line, is similar to that of Ocean island, with the exception that, about 1935, the gauge was altered from 2 ft. to 3 ft., a change rendered necessary by the increasing distance of the phosphate workings from the drying units. There are also several cableways, some fitted with powerful electric flood lighting for working at night, and a system of tramways at the working face in some parts of the fields.

Roads

Road development in the area is moderate. On Ocean island a narrow road connects the various settlements and circles the phosphate workings; it has a length of about 7 miles. The road is usable by motor vehicles (of which there are only a few on the island), but the surface consists of a levelled dressing of phosphate spread over the hard natural rock foundation of the island and requires constant attention, since it is frequently washed off by heavy rains. On Nauru a good motor road about 11 miles long encircles the island just above shore level, and another, Bruce's Highway, crosses the island from the government station in the south-west to the north of Anibare bay. A branch road from the south of the island joins this. There are also a number of tracks running across the island. In the Gilbert and Ellice islands a lagoon-side road, surfaced with reef sand and mud, runs the whole length of every island. These roads were first made at the instance of the early Polynesian missionary teachers from Hawaii and Samoa. They have a surface good enough for motor cycle traffic, and in places even for a motor car, but the frequent breaks

in the land of the atolls (rarely bridged) limit their use. The aggregate length of these roads is about 300 miles; the road on Abaiang, which runs continuously for about 25 miles, is one of the longest stretches.

Air Communications

Before the war no air services operated in the area, though several of the lagoons, especially Butaritari and Funafuti, had been suggested as suitable small bases for seaplanes or flying boats. But the development of air facilities during the recent military operations may lead to the establishment of civil air communications after the war.

Signal Communications

There are telephone systems on Nauru and on Ocean island, both being mainly the property of the British Phosphate Commissioners. No inland telephone or telegraphic communications existed elsewhere in the area before the war.

There is a government W/T station on Nauru, and there were before the war five W/T stations for public use in the Gilbert and Ellice Islands Colony (excluding the islands in the Eastern Pacific). Chief of the stations in the colony was that owned by the government on Ocean island; it was the clearing point for all traffic in and out of the colony (with the exception of a small volume between Funafuti and Suva). With its modern short and medium wave 500-watt transmitter Ocean island maintained regular schedules with Suva, Nauru, Rabaul and the other Gilbert and Ellice islands stations, as well as with shipping. At Tarawa the Burns, Philp (South Sea) Company maintained communication with other stations in the colony and with shipping, as also did the station at Butaritari, operated by W. R. Carpenter and Company (On Chong and Company). At Beru the London Missionary Society had a station communicating with Tarawa, Butaritari and Ocean island. At Funafuti a station which was the private property of the Administrative Officer of the Ellice islands operated with a government subsidy for the public service, communicating with Ocean island and Suva.

At Nauru and Ocean island there were radio-telephones owned by the British Phosphate Commissioners and used for private business, including communication with the vessels owned by the Commissioners.

NAURU

Nauru (lat. $0^{\circ} 30' S$, long. $166^{\circ} 55' E$) was discovered by Captain Fearn in the *Hunter* in 1798; it was formerly often called Pleasant island.

Physical Geography (Fig. 89, plates 38-41)

Nauru is about 12 miles in circumference and is approximately oval in shape, the only considerable indentation in the coast being the wide Anibare bay on the east side. The island is composed of



Fig. 100. Nauru: land utilization

The close relation between the physical features of the island and the use made of the land can be seen by comparison with Fig. 89. Based on Commonwealth of Australia Report to the Council of the League of Nations on the Administration of Nauru for 1939, and map (Canberra, 1940).

elevated coral limestone, and reaches a maximum height of 213 ft. above sea level. Around the island is a fringing reef, usually 75-100 yd. wide, but occasionally as much as 125 yd. wide. Behind the reef is a flat ring of land, the coastal belt, from about 150 to 600 yd. in

width, and consisting primarily of coral debris and coral sand. On the west side the coral is recent, but on the north and east especially there is also older dolomite, often in the form of jagged pinnacles, formed by the breaking down of cliffs by sand and wave action



Fig. 101. Nauru: communications and settlements

Based on: (1) A. F. Ellis, *Ocean Island and Nauru*, 2nd edition, end map (Sydney, 1936); (2) Commonwealth of Australia Report to the Council of the League of Nations on the Administration of Nauru for 1939, end map (Canberra, 1940).

(Plate 38). Behind the coastal belt the land rises steeply to a height of about 100 ft., with limestone cliffs in places. The interior of the island is undulating, with occasional low hills and rough coral masses which tower above the surrounding vegetation. A depression towards the south-east side is occupied by the lagoon known as

Buada (Plate 41), which is a little above sea level but which is affected by the tides, and which contains slightly brackish water. Other small lagoons lie near the coast (pp. 313, 355). The area of the coastal belt has been estimated at about 1,375 acres, and that of the high land at about 4,300 acres. On the high land the phosphate deposits are found, and where they have been removed an expanse of coral pinnacles remains.

Social and Economic Conditions (Figs. 100, 101)

Some details of the conditions at Nauru have already been given. Of the population of nearly 3,500 in 1940 about half were Nauruans and most of the remainder, with the exception of about 200 Europeans, were Chinese. While the Nauruan settlements, apart from that at Buada, are ranged all round the coastal belt of the island, those of the Europeans and Chinese are on the south-west side, with Yangor as the headquarters of the phosphate commission, and the government station near Makwa.

Amenities for the people are governed primarily by the presence of the phosphate industry, which has allowed a development unusual for a small tropical island. European staff houses, mess rooms, billiard room, etc., are situated among coconut palms and connected by straight even paths fringed with hibiscus and bright-leaved shrubs. The Chinese quarter, also methodically laid out, extends for some distance along the coast to the north, and has dwellings, kitchens, bath houses, recreation rooms and reading rooms. There are refrigeration and electric light plants and a telephone system for the settlements in general; shower baths and a sewage system for the European houses and the Chinese quarters, and hospital accommodation for the different sections of the population. A cinema, a golf course (for Europeans), football grounds (for Europeans, Nauruans and Chinese) and other facilities give many opportunities for recreation, and it is noteworthy that the Chinese, who have recently developed football and other ball games, play matches against European and Nauruan teams.

OCEAN ISLAND

Ocean island (lat. $0^{\circ} 52' S$, long. $169^{\circ} 35' E$ —but reported in 1937 to lie 3 miles south-west of its charted position) was discovered from the *Ocean* in 1804. It is sometimes known by its native name, Banaba.

Physical Geography

The island has been likened in shape to an oyster, being almost circular except for a wide indentation, Home bay, on the south-west. It comprises about 1,500 acres in extent. The island is of elevated coral formation, with a central plateau rising to a maximum height of 280 ft. above sea level, and slopes descending fairly regularly from the plateau to the coast. Cliffs from 10 to 30 ft. high encircle the island except for a short stretch on the south-west side, on the

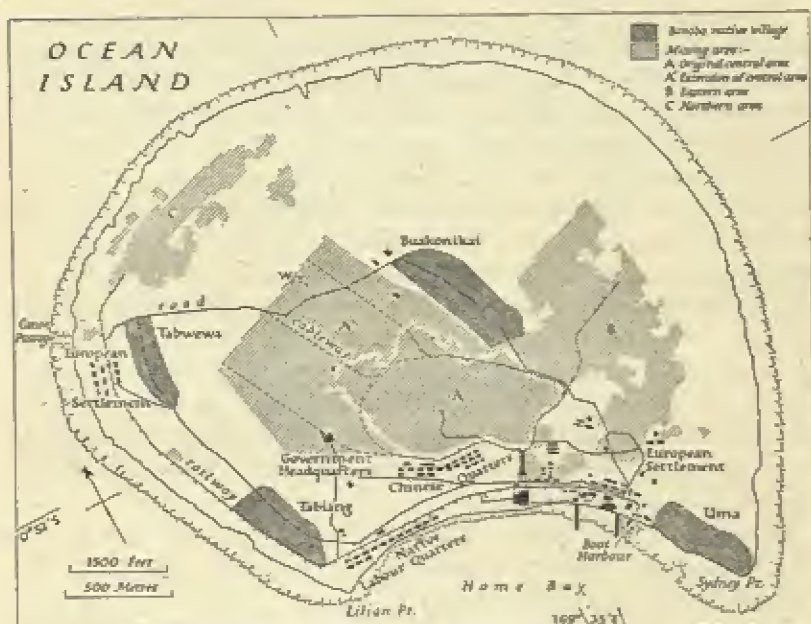


Fig. 102. Ocean island

Based on: (1) A. F. Ellis, *Ocean Island and Nauru*, 2nd edition, end map (Sydney, 1936); (2) Admiralty chart no. 979; (3) other official sources.

southern shore of Home bay, and in the vicinity of Sydney point, where there is a fine beach of white coral sand and shingle. A fringing reef surrounds the island, extending practically level from the shore for an average distance of perhaps 100 yd. The reef is dry at low tide, and at high spring tides has a depth of about 6 ft. of water over it; the edge is particularly serrated and broken by deep channels with jagged sides, and falls rapidly away to very deep water.

The bedrock of the island is of limestone, assuming apparently

everywhere a pinnacle formation, which on the northern, eastern and south-eastern sides forms a dense belt 15-20 ft. high, with an average width of about 50 yd., and almost impassable. Among the pinnacles, and overlying them completely on the plateau, is the phosphate deposit which forms the wealth of the island. The rocks along the coastline are coral limestone, very hard, dense and jagged. The reef rock is mostly a conglomerate of coral sand and shingle.

Social and Economic Conditions

The population of Ocean island, approximately 2,300 in 1931, was estimated at about 2,800 in 1936, the increase being due almost entirely to Chinese, who at the latter date formed nearly one-third of the population. The Europeans numbered about 130 and the remainder of the population was made up of Gilbertese labourers and Banaban natives and their families. Most of the people live on the south-west and west of the island. The Europeans employed by the phosphate commission live in staff houses at Uma (Ooma) if unmarried, and at Tabwewa (Tapiwa) if married. The government officers live near Tabiang, with the Residency some little distance inland. The quarters for the Chinese and the recruited Gilbertese labourers are situated between Uma and Tabiang. There are Banaban native villages at the three places named, and another village at Buakonikai, near the centre of the island (Fig. 102). Communications have already been described (pp. 361-3) and also port facilities (p. 359; plates 53, 54).

Ocean island is of particular importance in relation to the islands to the eastward through being the administrative centre of the Gilbert and Ellice Islands Colony.

Amenities on Ocean island are largely dependent upon the phosphate industry, and are very similar to those on Nauru.

GILBERT ISLANDS

The Gilbert islands, formerly also known as the Kingsmill group, extend approximately between lat. 4° N and 3° S and long. 172° and 178° E. They comprise sixteen atolls (or islands), of which the most important are Butaritari and Tarawa. All are low-lying, the greatest elevation being about 12 ft. above high-water mark, and the land width varies from $\frac{1}{4}$ mile to $1\frac{1}{4}$ miles. The islands are thickly wooded, the coconut palms growing to a height of 60-70 ft., so that with good

visibility they may be seen from a ship's deck at a distance of about 9 miles.

Locally a distinction is drawn between 'lagoon islands', which are accessible to the inter-island trading vessels; 'outside anchorages', where the lagoons have boat passages only and ships anchor outside; and 'reef islands', which have no lagoons and where the reef is



Fig. 103. Butaritari, Abaiang, Maiana and Abemama (Gilbert islands)

Most of the boat passages (marked P) can be used only between half-tide and high-water. (For *Kena* read *Kenea*). Based on: (1) Admiralty charts nos. 731, 3269; (2) other official sources.

steep-to and anchorages unsafe. During the fine weather season, with steady offshore winds, vessels may anchor close in at these 'reef islands' without swinging room, but should the weather be unsettled or calm, they have to stand off and on while working.

As yet the group is imperfectly charted and navigation demands great care, particularly on the western (lee) side, where there are many sunken reefs and spits. Some of the islands are incorrectly

placed on the charts, and while others have observation spots definitely fixed the relative positions of the ends of the islands, or of the reefs, may not be accurately shown. The equatorial current flows through the group, usually with a westerly set at a rate of 20-30 miles a day, but is irregular in direction and force.

MAKIN MEANG (LITTLE MAKIN)

Makin Meang—locally known as Makin (lat. $3^{\circ} 16' N$, long. $172^{\circ} 58' E$)—is the most northerly of the Gilbert islands and is separated from the larger atoll of Butaritari (Makin) by a channel rather more than a mile wide (Fig. 103). It lies on a reef, upon an extension of which there are two islets, Kiebu and Onne, which are joined with Makin Meang at low water. The west coast of Makin Meang forms a bight with a depth of from 6 to 8 fathoms, at the head of which is a village with about 100 native houses, a church and a government station. There are about 50 native houses on Kiebu. There are no safe anchorages, but two boat passages on the west side and one on the east side of Makin Meang, and one on the west side of Kiebu, are available at high water. The landing is good and may be made at any time.

The estimated population in 1936 was about 750, including one European and one Chinese. A road encircles Makin Meang, and another runs along the western side of Kiebu.

BUTARITARI

This is also known as Makin, which was once its correct native name, but it has been officially and locally given the name Butaritari from that of the largest island of the atoll. It lies approximately in lat. $3^{\circ} 02' N$, long. $172^{\circ} 48' E$, but has been variously reported to be both east and west of the charted position. It is a large atoll of roughly triangular shape (Fig. 103), with its north, south-east and west sides 17, 14 and 12 miles long respectively. Two long islands divided by a shallow passage form the south-east side (Plate 36); the north side consists of a continuous coral reef with three boat passages. The west side is made up of detached islets and patches with passes between them.

There are two passes into the lagoon capable of accommodating large vessels. The main entrance, with a width of 600 yd. and depth of 13 fathoms, lies between Kotabu islet and Flink point in the south-west corner of the atoll. Three channels lead from this to the main anchorage. The other pass, north of Nabuni island, has a depth of about 10 fathoms and a width of 800 yd. In addition there is a difficult pass north of Kotabu islet.

Ships can anchor outside the atoll on a sunken reef, in from 4 to 12 fathoms, west of Flink point, or off the south-east or north-east sides of the atoll. Good anchorage is obtainable inside the lagoon, where there is a depth of from 5 to 10 fathoms off the main island of Butaritari. On the lagoon side of Butaritari there were, before the war, four 'wharves' with shallow water alongside (Fig. 104). They were: On Chong's Wharf (with loading space 150 ft. by 25 ft.); King's Wharf (1,000 ft. long and 12 ft. wide); Stone Pier (500 ft. long and 15 ft. wide); Government Wharf (176 ft. long and 12 ft. wide). All cargo is handled by lighters.

Rain water is obtained by catchment from European houses or from native wells. Up to 50 tons of good water may usually be obtained from cisterns.

The estimated population in 1936 was about 1,650, including a few Europeans and Asiatics. The main settlement consists of straggling clusters of houses, occasional warehouses, the hospital and the government station, built along a road

which runs from near the government wharf to Ukiangong, a village of about thirty houses in the extreme south of the atoll. There are other villages at Tanimaiki in the east of Butaritari island, at Keuea and Kuma on the adjacent island, and on Bikati in the north-west of the group. Before the war Butaritari was the headquarters of important trading firms.

MARAKEI

Marakei (Fig. 106), with a charted position in lat. $2^{\circ} 03' N$, long. $173^{\circ} 25' E$, is reported to lie 2 miles south and 10 miles west of this. It is a small, almost perfectly formed atoll, measuring about 5 miles by 3 miles. Its deep lagoon is entirely land-locked at low water, but two passages give access to it for boats at high tide; the

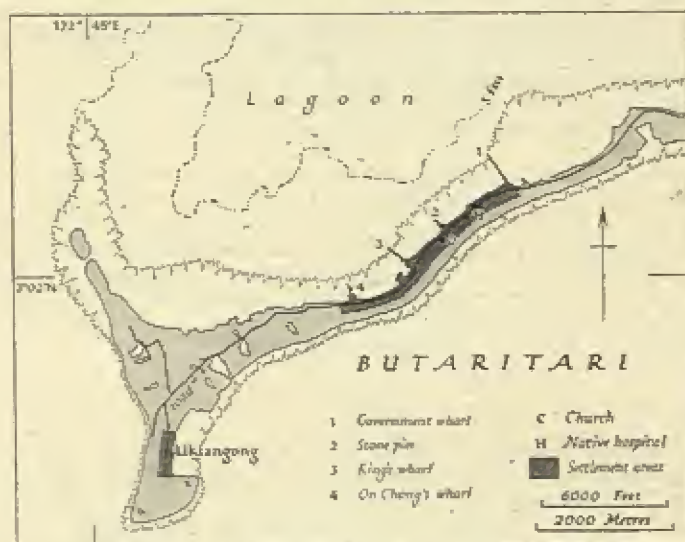


Fig. 104. Butaritari; the main island

The lagoon has many coral patches, and the 5-fathom line gives only a general indication of depth. The shape and position of the point on the north-west side are only approximate. Based on official sources.

western passage, the only one used, is at Baretoa near the south-west point. This is crossed by a wooden foot-bridge, under which small boats pass, even at high tide. The main anchorage is in 8 fathoms off Rawanawi on the west side; there is also sheltered but limited anchorage in 6-8 fathoms off Baretoa. Both are impracticable from November to March because of a northerly swell. Another anchorage off a trading station midway between Baretoa and Rawanawi is available only during fine weather, in east-south-easterly to north-north-easterly winds, and is not recommended. Landing on the outside of the lagoon can be made at Rawanawi, where a passage has been blasted through the reef, and sometimes in westerly winds across the reef on the north-eastern side of the atoll. Two other boat landings are reported on the west side. Inside the lagoon there is a jetty about a mile south of Rawanawi, and a little farther south there are two smaller jetties.

The population in 1936 was about 1,680, including a few Europeans. Rawanawi

is the principal settlement, with a government building, a church, and about 125 native dwellings. Other settlement is scattered along a road which runs from 10 to 15 ft. wide round the whole atoll.

ABALANG

Abaiang (lat. $1^{\circ} 45' N$, long. $172^{\circ} 59' E$, at Bingham channel) has been reported to be 3 miles east of its charted position. It is a large atoll about 16 miles long and 5 miles wide, with a continuous strip of land along the east and north-east sides, and numerous detached islets on the reef on the west side (Fig. 103). The main entrance to the lagoon is through Bingham channel, with a width of 300 yd. and a depth of 11 ft., near the eastern end of the south-west side.

Farther north is North-west channel, about 200 yd. wide, with a reported depth of 14 ft.; it is seldom used. There are also two boat passages immediately south of Bingham channel, South boat passage being the better of these. Several passages immediately north of North-west channel are used only by native canoes. Large vessels have to anchor outside the lagoon on the south-west side, in 8-10 fathoms off Bingham channel or 6-8 fathoms off North-west channel, or in 6-10 fathoms off Nanikirata islet. Vessels up to about 700 tons can anchor in the lagoon to the west of Tabontebra.

There is a landing at Morikao on the north-east side, where a channel has been blasted through the reef, and another on the ocean side of Ribono island in the extreme north of the atoll. In 1936 the native population amounted to about 2,400 with a small number of Europeans. The island is one of the principal stations of both the London Missionary Society and the Roman Catholic mission, and the latter has a printing press there. The chief villages are Koinawa, Tabontebra and Taboneaba, but other settlements are scattered along a road 25 miles long running the whole length of the eastern land rim.

TARAWA

Tarawa, lying approximately in latitude $1^{\circ} 20' N$, long. $172^{\circ} 55' E$, is an atoll of roughly triangular shape about 22 miles long and 9 miles wide (Fig. 105). On the south and east sides there is a continuous coral reef with numerous islands on it separated only by short distances. The largest, Betio (Bititu), lies at the south-west corner of the atoll. It is about 2 miles long by about $\frac{1}{2}$ mile wide. The western or lee side of the atoll consists of a broken chain of sunken reefs. A good ship pass leads through the sunken reef about $3\frac{1}{2}$ miles north of Betio. It is about 1 mile long with a width of 300 ft. between 5-fathom lines. Several boat passages lead into the lagoon; a good one lies between Bairiki and Eita islands. The lagoon, though thickly studded with coral patches and reefs, provides excellent anchorage and ships frequently lie there when waiting to proceed to Ocean island or Nauru. There are depths of from 5 to 8 fathoms off Betio, and other anchorage ground is off Bairiki and Buota islands. Anchorage is also possible in the lee of the atoll. Landing facilities at Betio formerly comprised a jetty of coral blocks 1,600 ft. long and 25 ft. wide at which lighters could load, the water being too shallow for ships to come alongside. There were also other small jetties. At high tide landing can be made at several places on the lagoon side of the atoll, where there are smooth, clear sandy beaches, and also over the reef on the west side of Betio.

The population in 1936 was about 2,600, including about 20 Europeans. There are some half-dozen main native settlements, and road facilities exist in Betio.

The atoll, occupied by the Japanese early in 1943, was used by them as their principal base in the Gilbert islands; it was reoccupied by United States forces early in 1944.

MAIANA

Maiana (lat. $1^{\circ}00'N$, long. $173^{\circ}01'E$, approximately) lies 20 miles south of Tarawa. It is a quadrangular atoll about 10 miles long by 7 miles wide, with a continuous stretch of land on its north-east and south-east sides and protected on the other two sides by a broken reef awash in places at low water (Fig. 103). There is



Fig. 103. Tarawa, Gilbert islands

Position and scale are approximate only. Villages (marked in black) include most of those existing in 1941. Based on: (1) Admiralty chart no. 3269; (2) other official sources.

no ship pass into the lagoon. Three boat passages lead into the lagoon on the west and north-west sides; there are also two small passages through the reefs near Bikerei on the north-east side, but they can be used only at high tide in good weather. The main anchorage in 6-12 fathoms is outside the reef, off the north-west

side of the atoll, but small craft can also anchor off the extreme south of the atoll. There is a small landing jetty for boats inside the lagoon, opposite the village of Tebiauca.

In 1936 the population of Maiana was about 1,400, including two Europeans. There are several villages distributed along a rough road of coral and mud which runs from Bikerei along the whole length of the land ridge.

ABEMAMA

Abemama (lat. $0^{\circ} 23' N$, long. $173^{\circ} 55' E$, approximately, at Binoiano village) is an atoll of oval shape about 15 miles long and 6 miles wide (Fig. 103). A strip of

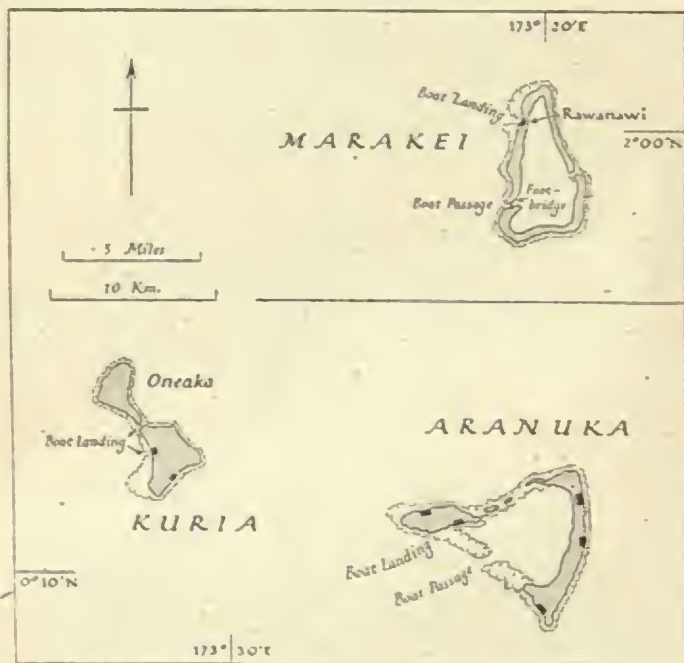


Fig. 106. Marakei, Kuria and Aranuka (Gilbert islands)

Based on Admiralty charts nos. 731, 3269.

land about $\frac{1}{2}$ mile wide runs round the eastern half of the coral rim, but is broken at intervals by several shallow passes which are crossed by foot-bridges. The west side of the atoll consists of a coral reef broken by two passages. They are South passage, 600 yd. wide and about $5\frac{1}{2}$ fathoms deep, with Bike (Entrance island) immediately to the south of it; and Western passage (least depth, 2 fathoms). The best anchorage is in the lagoon opposite the village of Binoiano, where there is ample room for small vessels with depths of from 3 to 7 fathoms. Anchorage is also possible just to the north of South passage, but is not recommended owing to strong tidal currents. There are two jetties, one 30 ft. long on the lagoon side of Binoiano and the other 100 ft. long off Kabangaki village. Landing can be made at various points on the atoll rim, notably from a channel near Binoiano.

In 1937 the population was 1,010, including several Europeans. The inhabitants occupy several villages, of which one of the principal is Binoinano. A road about 10 ft. wide runs the whole length of the land ridge, but is restricted for vehicles owing to the light foot-bridges across the various channels.

KURIA

Kuria (lat. $0^{\circ} 14' N$, long. $173^{\circ} 29' E$, at its eastern extremity) really consists of two islands, Onaka in the north-west and Kuria in the south-east (Fig. 106). They lie on one reef, but are separated by a shallow channel which is easily fordable at low water. Together the islands are 5 miles long and 2 miles in greatest width. Both are densely wooded with pandanus, coconut and low scrub. The reef on which they lie surrounds them completely and extends about a mile westward of Kuria at its widest point. Anchorage is obtainable off the west side of the narrow gap between the islands, and good shelter is obtainable there from the prevailing easterly winds. The best landings are made through two openings in the reef—west of the gap between the two islands, and off the west of Kuria. In calm weather at high water it is possible to land over the reef on the south side of Kuria.

In 1936 the population of the island was about 240 and included one European. The only village of importance (said to be the only one in 1940) is Tuangaona.

ARANUKA

Aranuka (lat. $0^{\circ} 12' N$, long. $173^{\circ} 41' E$) is 13 miles south-west of Abemama. It is an atoll consisting of a shallow triangular lagoon roughly 5 miles by 6 miles, enclosed on the east by a long narrow island, on the north-west by a reef with isolated islets, and on the south by a reef through which there is a shallow boat passage; a second island forms the western extremity (Fig. 106).

The passage is shallow and owing to strong currents can only be used on a rising tide near the flood. Anchorage is outside the lagoon about $\frac{1}{4}$ mile south-east of the boat passage in 8-10 fathoms, or for smaller vessels just to the east of the entrance. Landing can be made over the reef on the eastern side of the main island in westerly weather.

In 1936 the population, including one European, was about 290. In 1940 there were said to be several small native villages on the main (eastern) island and two on the western island. But another account stated that there was only one permanent village and another smaller temporary village where the people lived during the pandanus harvest. The government station and a trader's store were also on the eastern island, where there is a poor road which runs for its whole length on the lagoon side.

NONOUTI

Nonouti (lat. $0^{\circ} 40' S$, long. $174^{\circ} 27' E$) is the most northerly of the southern Gilbert islands. It is an atoll about 24 miles long by 10 miles wide, of irregular shape (Fig. 107). There is an almost continuous stretch of islets for a distance of 18 miles on its eastern and southern sides. The reef on the west and south sides is for the greater part submerged at considerable depths. A ship pass, Archer entrance, with a least depth of 4 fathoms, leads from the south-east corner by devious channels to various anchorages inside the lagoon, which is studded with coral patches. There are numerous boat passages, mostly shallow.

Outside the lagoon there is an anchorage off the southernmost point of the lagoon except in westerly weather, and inside the lagoon there is anchorage for

The island suffered severely in a drought in 1937-9. Distress was alleviated by government grants of rice, but some hundreds of the people migrated under government auspices to the Phoenix islands.

TABITEUEA

Tabiteuea (lat. $1^{\circ} 15' S$, long. $174^{\circ} 45' E$, approximately, at Peacock anchorage) lies about 20 miles south of Nonouti. It is an atoll of irregular shape about 30 miles long from north-west to south-east (Fig. 108). The eastern side is a fairly continuous strip of land and coral reef at low water, but at high water constitutes two comparatively large islands—Eanikai at the northern end and Nuguti at the southern end of the atoll—with numerous islets between them.

The lee (south-west) side of the atoll consists in the north of a sunken reef

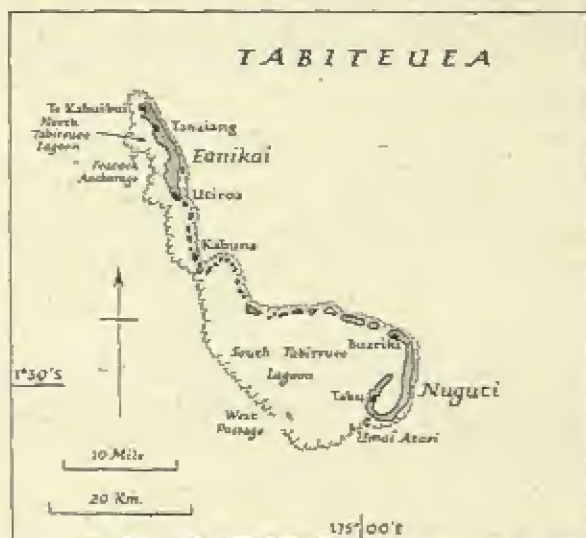


Fig. 108. Tabiteuea, Gilbert islands

The position shown for West passage is only approximate. Based on: (1) Admiralty chart no. 731; (2) other official sources.

comparatively close inshore and forming a very shallow lagoon; but towards the south an ordinary barrier reef forms a second lagoon about 6 miles wide. These lagoons are separated at low water by shallows and extensions of the shore reef.

Navigation in the neighbourhood of Tabiteuea is rendered dangerous by shoals and uncharted extensions of the reef. There are two passes into the southern lagoon, from the south-west and the west, the latter being the best entrance; both are capable of taking a ship with a draft of 12 ft. There are several boat passages, one being 2 miles to the west of Umai Ataei islet off the south end of the atoll, another (reported bad) off Tanaiang village. Anchorage can be obtained in the south lagoon; off the boat passage at the south end of the atoll; on the eastern side of the atoll, off Buariki; and at Peacock anchorage (5-12 fathoms) and Utiroa anchorage (6-8 fathoms) off Eanikai islet (where there is a landing). Water is available in cisterns, but there is no regular means of transporting it to ships.

Tabiteuea has the largest population of any island in the Gilbert and Ellice Islands Colony, there being 3,830 inhabitants in 1936, though only 4 Europeans. In consequence of population pressure there has been some migration to the Phoenix islands, and a number of the younger men engage themselves for work at Ocean Island. There are mission stations and trading stations in the atoll and native villages on most of the islets, the most important being Tanaiang, Utiroa, Buariki and Taku. About 400 tons of copra were formerly exported annually.

BERU

Beru (lat. $1^{\circ} 21' S$, long. $175^{\circ} 57' E$, approximately) is an atoll lying 52 miles east of Tabiteuea. It consists of an island on the east side about 11 miles long from north-west to south-east, with a barrier reef on the south-west side joining the two curving ends of the island and forming a lagoon 2 miles wide (Fig. 107). The lagoon is shallow and obstructed by coral and access to it is obtained only by boat passages. One of these, usable only at half tide to full tide, is through the barrier reef on the south-west side of the atoll; there are several giving access to Taboiaki, on the south side; and one is reported as a cut in the reef on the eastern side, opposite the village of Rongorongo.

Off the south-west side of the lagoon is Espiègle anchorage—with depths of 5-7 fathoms 300 yd. from the reef, for small vessels; or 12 fathoms 400-600 yd. from the reef, for larger craft. Another possible anchorage, in fine weather only, is off Taboiaki in the south side of the atoll, in 9 fathoms. Other anchorages are also reported. There is a stone jetty 25 ft. long off the village of Tabukinberu, and also a wooden pier off the village of Rongorongo; both are suitable only for landing from boats.

In 1936 the population was nearly 2,500, including 14 Europeans. There are numerous native villages, the most important of which are Tabukimberu, where the headquarters of the Southern Gilbert Islands District are situated, and Rongorongo, the headquarters of the London Missionary Society. A road follows the coast of the lagoon side of the island, and a causeway runs across the bight at the southern end of the lagoon.

NIKUNAU

Nikunau (lat. $1^{\circ} 20' S$, long. $176^{\circ} 28' E$) lies about 25 miles east of Beru. It is about 8 miles long and $1\frac{1}{2}$ miles broad, with the long axis running from north-west to south-east (Fig. 109). At the northern end is a small completely landlocked lagoon, and the island is fringed with a narrow coral reef. Off the two ends banks extend about 2 miles to the north-west and $\frac{1}{2}$ mile to the south-east.

There is no anchorage protected from all winds, but at numerous places off the western side of the island there is indifferent anchorage in the prevailing easterly winds. Landing facilities consist of a jetty for small vessels off Muribenoa village, which can be reached over the reef by boats at high water; another off Rongata, which can be reached through a channel blasted in the reef; and a small jetty near Nukumanu village, which can be reached only by boats passing over the reef.

In 1936 the population was about 1,760, of whom 3 were Europeans. The principal villages are Rongata (or Rungata) and Nukumanu, but there are many dwellings scattered along a rough mud and coral road which runs along the west side of the island. In recent years the island has lost some population by migration to the Phoenix islands.

ONOTOA

Onotoa, with a charted position in lat. $1^{\circ} 47' S$, long. $175^{\circ} 29' E$, is reported to be 2 miles farther west at its northern end, and 4 miles farther east at its southern

end. It is an atoll about 12 miles long. The eastern side of the lagoon consists of a chain of islands grouped in the form of a bracket. The west side is a broken reef (Fig. 107).

The lagoon is shallow, and there are no deep passes suitable for ships, but there are several boat channels. In the north, vessels up to 6 ft. draft can approach close to Tanyah island at high water, and there is a small boat passage at the southern end of the reef. Two passages are also reported between islands on the eastern side. The main anchorage lies to the west of the south end of the atoll near the village of Tabuarorae, where a small jetty runs out from the coast.

The population in 1936 was about 1,600, all natives. The island suffered severely in the drought of 1937-9, and many people migrated to the Phoenix islands under the government scheme.

TAMANA

Tamana (lat. $2^{\circ} 29' S$, long. $175^{\circ} 58' E$) lies about 4 miles south of Onotoa. It is an island about 3 miles long and $\frac{1}{2}$ mile wide, surrounded by a fringing coral reef

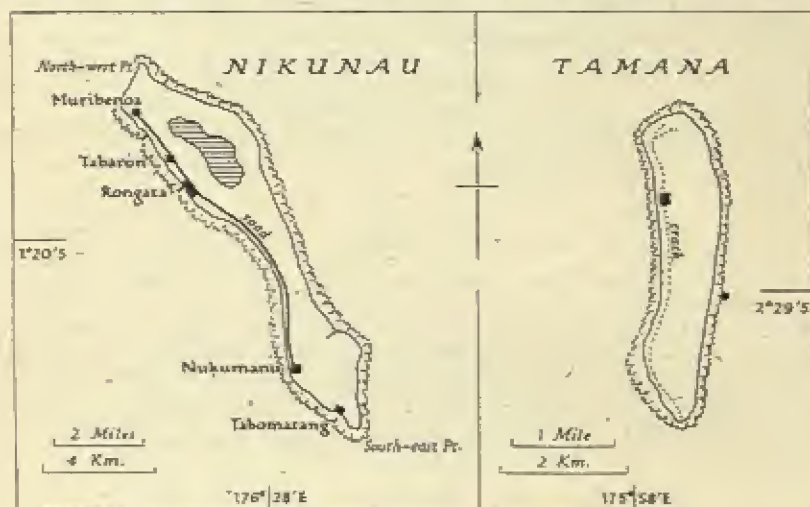


Fig. 109. Nikunau and Tamana, Gilbert islands

Based on official sources.

(Fig. 109). Anchorage, which is very restricted and subject to swell, can be obtained by small vessels in the bight on the west side of the island. A channel blasted through the reef leads to a landing there, but it is dangerous because of the surf.

The population, which is entirely native, was estimated to be about 1,100 in 1936; one principal village stands on the west side of the island.

ARORAE

Arorae (lat. $2^{\circ} 39' S$, long. $176^{\circ} 49' E$) is reported to lie 3 miles west of its charted position. It is the most southerly of the Gilbert islands, lying about 50 miles south-east of Tamana. It is surrounded by a coral reef, and has a length of about 6 miles and a width of $1\frac{1}{2}$ miles.

There is an anchorage close to the reef on the west side, but this is restricted

and provides no swinging room. Owing to the surf, landing is usually made in native canoes.

In 1936 the population (all native) was estimated to be about 1,500. There are three villages but no trading station on the island.

ELLICE ISLANDS

The Ellice islands extend between about lat. 5° S and 11° S and long. 176° E and 180° . They comprise nine islands, all inhabited, but with much smaller individual populations than those of the Gilbert islands.

NANUMEA

Nanumea, the most northerly of the Ellice group, lies in lat. $5^{\circ} 39'$ S, long. $176^{\circ} 06'$ E. It is a coral reef of extended crescent form, with two main islets, Lakena and Nanumea proper, on the north-western and south-eastern ends. The islets are 3 or 4 miles apart, and the connecting reef is dry at low water. Anchorage is to be had off the north-western end of Lakena, and landing is made on the western side of Nanumea. Lakena, which is nearly round, is about 2 miles across and has a deep freshwater lagoon; Nanumea has a shallow lagoon opening to the east.

The population of Nanumea in 1936 was estimated at 775, distributed between two villages. Lakena, until recently at least, was uninhabited, but was used for cultivation by the people of Nanumea.

NANUMANGA

Nanumanga, formerly called Hudson island after the commander of Wilkes's vessel the *Peacock*, lies in lat. $6^{\circ} 18'$ S, long. $176^{\circ} 20'$ E. It is very small, being only about $1\frac{1}{2}$ miles long by 1 mile broad. It is a coral island surrounded by a low fringing reef, with an unusually precipitous face to seaward. There is no lagoon and no anchorage, and landing is difficult. The fresh water there is of poor quality.

The population was estimated at 545 in 1936. Louis Becke, author of several literary works which give a good picture of the native life in the Ellice and other islands in the latter part of last century, lived for a year on Nanumanga.

NIUTAO

Niutao, in lat. $6^{\circ} 06'$ S, long. $177^{\circ} 16'$ E, is roughly triangular in shape and a little over a mile across at the widest part. It is surrounded by a narrow fringing reef, and has a tiny lagoon in the centre. Anchorage can be found in about 17 fathoms off the western end in the prevailing easterly winds, or off the eastern end in westerly winds. The best landing is on the west side. There is no entrance into the lagoon. Brackish water was formerly obtained from wells sunk in the coral, and a small quantity of water may be obtained there by vessels. The island is heavily wooded with coconut palms.

The population, which was given as just over 400 by Moresby about 1875, was estimated at about 600 in 1936. There is only one village, on the south-west side.

NUI

Nui, in lat. $7^{\circ} 16'$ S, long. $177^{\circ} 10'$ E, is shaped like a crescent running north and south. It is about 10 miles long and has two main islets, one at each end. There is no entrance to the lagoon, and no safe anchorage, though vessels anchor off the

south-west point in easterly winds. Landing there is difficult, and copra is loaded over the reef in flat-bottomed surf boats.

The population, said to be about 200 in 1875, was estimated at about 430 in 1936. The people are closely affiliated in culture and language with the Gilbertese. The only islet permanently inhabited is Fanatapu, at the south end; it has a well-kept road running across it. In normal times about 100 tons of copra are exported annually.

VAITUPU

Vaitupu, in lat. $7^{\circ} 30' S$, long. $178^{\circ} 41' E$, is a pear-shaped island about $3\frac{1}{2}$ miles long by 2 miles in greatest width (towards the south-east). The island is completely surrounded by a fringing reef, much of which is dry at low water, and has two lagoons—the smaller, Te Loto, at the northern end, and the larger, Te Namo, towards the south-east end (Fig. 96). The former has one entrance and the latter two, across the reef, but only one of the last is really practicable for boats at high tide.

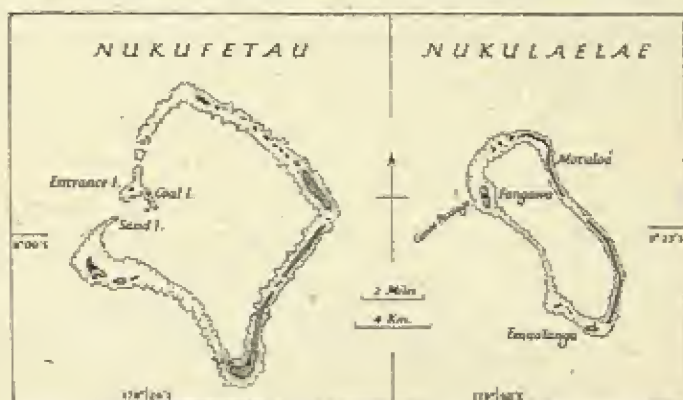


Fig. 110. Nukufetau and Nukulaelae, Ellice islands

Based on Admiralty chart no. 766.

There is anchorage in 7 fathoms off the village, on the south side, but landing is difficult and native canoes are used.

Though comparatively small, Vaitupu is one of the most populous of the Ellice islands, its soil being rather better in quality than that of most. The population, stated to have been about 375 in 1875, was estimated at 687 in 1936. There are two trading stations on the island, and the Government Native Boys' Boarding School for the colony is situated there. Through the research of D. G. Kennedy, formerly headmaster of the school, the culture of the native people of Vaitupu is better known than that of the people of any other island of the Ellice group.

A private short-wave W/T set (unregistered) was formerly operated there.

NUKUFETAU

Nukufetau, in lat. $8^{\circ} 00' S$, long. $178^{\circ} 29' E$, is an atoll of oval shape, comprising 37 islets on a barrier reef enclosing a large lagoon (Fig. 110). The circuit of the atoll is rather more than 20 miles. There is a good ship channel into the lagoon on the north-west side, and anchorage of good sheltered quality can be found in many places there. The lagoon has been suggested as a suitable base for flying-boats.

The *Calophyllum inophyllum*, known to the natives as *fetau*, is said to be the only indigenous tree there, and the name of the island is attributed to this fact. The population, estimated at about 240 in 1884, was estimated in 1936 at about 400. The main village is on the islet of Te Anamu, on the western side.

FUNAFUTI

Funafuti atoll, in lat. $8^{\circ} 31' S$, long. $179^{\circ} 12' E$ at Funafuti islet, in general shape resembles a pear with a curved stem pointing southwards. The lagoon, about 10 miles long and 8 miles broad at the widest part, is from 24 to 30 fathoms deep in the deepest part. It is bounded by about 30 islets, joined by reefs, but while these form an almost continuous line on the eastward (windward) side, there are many gaps on the westward (lee) side (vol. I, Fig. 17).

Of the passages into the lagoon, however, those on the west side are not safe for vessels, and three only can be used. To the south-east are Te Puapua and Te Ava Mateika, close together, and each having depths of about 4 fathoms. The former is preferable, but both have coral patches and need local knowledge to navigate. On the north of the atoll is the passage known as Te Ava i te Lape, which has a depth of 4 fathoms and was reported from air survey in 1938 to be clear. The lagoon itself has many dangers from coral patches, but good anchorage in 10 fathoms is to be found to the west of a government pier. This pier is suitable only for boats, for which there is easy landing in 3 ft. of water at low tide. Funafuti is a port of entry for the Gilbert and Ellice islands.

The largest islet of the atoll, giving its name of Funafuti to the atoll as a whole, extends for 7 miles, occupying about half the windward side and resembling a reversed L in shape. The concave side faces the lagoon, and in the centre an area of about a dozen acres is occupied by a swamp, connected with the sea by subterranean channels and ankle-deep at high tide; it is ringed round by mangroves. Along the whole windward face of the narrow islet stretches an embankment of shingle and huge rolled coral boulders, much weathered and lying in a confused mass. From the base of this bank the reef stretches for 40 or 50 yd. to seawards in a bare level expanse of shore platform, which dries at low tide in calm weather, but is riven by deep fissures. Inland from the embankment lies a surface of small loose blocks of decaying coral, only a foot or so above high water mark, and interspersed with little pools formed by tidal leakage at high water. But immediately to the north and south of the swamp a considerable area of sandy soil takes the place of the coral and allows of cultivation. Here also are wells and bathing pools.

The northernmost islet of the atoll stands several feet higher than the others, and has a richer red soil, with bananas flourishing in the dry ground and not grown in a swamp as is the more usual Ellice islands fashion.

A traverse of a leeward islet crosses a formation different from that of a windward islet. The dry land is a tolerably level expanse of sandy soil, and a broad sandy beach extends round each islet. Moreover, the islets are not arranged so strictly along the margin of the reef as they are on the windward side of the atoll.

The population of Funafuti in 1936 was about 350. In the early part of the nineteenth century it was said to be about 3,000, but this is probably an over-estimate. However, it was certainly much larger than at present. The ravages of disease and the kidnapping of a large number of the people about 1863 by Peruvian labour raiders so reduced it that in 1870 there were only about 160 people on the atoll. Their numbers gradually increased from this time, being assisted by colonists from Samoa, the Tokelau group, Manihiki and some of the other Ellice islands, so that at the present time the population is of a composite origin.

Funafuti is notable for its well-kept houses, with coral-rubble floors, smoothly cemented, raised to a height of about 2 ft. above the ground. A large public hall for

dancing is similarly floored. Another feature of the main village is a pig compound several acres in extent, surrounded by a solid coral wall.

The island is the only port of entry in the Ellice group. Some coal is generally obtainable there, and there is one lighter. Drinking water, mainly from cisterns fed by roof catchment, can be had in quantity and is brought off in kerosine tins by the boats of the Burns, Philp company. Pigs, fowls, fish, bananas and coconuts are also obtainable. Funafuti is the administrative headquarters of the Ellice group, and there is a hospital and a W/T station.

NUKULAE LAE

Nukulaelae lies in lat. $9^{\circ} 22' S$, long. $179^{\circ} 50' E$. It comprises about a dozen islets, the two largest of which are very long and narrow, situated on a barrier reef which is submerged for much of its length on the western side (Fig. 110). There is no entrance into the lagoon, and the only anchorage is a precarious one in 7 fathoms to the west of Fangawa, the most southerly islet of the atoll. There are said to be two boat passages, but landing is difficult.

The population was about 250 in 1936. (About 1860 it was estimated at about 400, of whom about 300 were taken away shortly afterwards by the Peruvian labour raiders.) Nukulaelae, from which the atoll takes its name, is not the principal islet; this is Fangawa, the site of the only village.

NIULAKITA

The name of this island was often formerly written Nukulakita, or Nurakita; an alternative name was also Sophia island. Niulakita, in lat. $10^{\circ} 45' S$, long. $179^{\circ} 30' E$, is the most southerly island of the Ellice group. It is about $3\frac{1}{2}$ miles in circumference and is slightly higher than the other islands. It is surrounded by a fringing reef, and landing is difficult except in native canoes. Anchorage is obtained in 7 fathoms off the south-west side and in 7-12 fathoms off the north side.

The island is thickly wooded, mainly with the palms of a coconut plantation. The population was estimated in 1936 at 39 inhabitants, all natives. In ancient times it also bore a permanent population, but for most of the nineteenth century it seems to have been uninhabited, until phosphate was worked there towards the end of the century by an American, with native labour.

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For maps see Appendix I.

Chapter X

THE KERMADECS, NORFOLK AND LORD HOWE

The Kermadec Islands—Raoul (Sunday) Island, Macauley Island, Curtis and
Cheeseman Islands: Norfolk Island: Lord Howe Island: Bibliographical Note

The Kermadecs, Norfolk and Lord Howe all lie well to the south of the islands described in other chapters of this volume. They are marginal to New Zealand and Australia rather than to the major island groups of the Western Pacific. Only on Raoul island is there

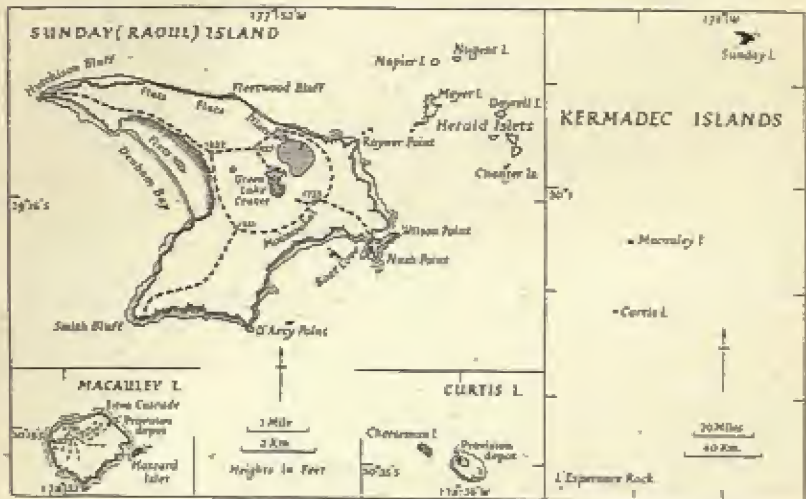


Fig. 111. Kermadec islands

According to recent information the provision depots no longer exist. Based on G.S.G.S. map no. 4318.

evidence of even temporary pre-European occupancy; and at the time of their discovery all were uninhabited. After the establishment of penal settlements in New South Wales and on Norfolk island in 1788 the Kermadecs and Lord Howe were sighted occasionally by transports. It was the establishment of whaling, however, which first gave them a place in the economic life of the Pacific and led to the first settlement of Lord Howe island and Raoul island. Today they are of no great commercial value. Norfolk island is, however, a station on the trans-Pacific cable from Banfield (Vancouver island)

to Australia and New Zealand; and they all have some importance for the study of weather conditions in connection with Pacific air services.

THE KERMADEC ISLANDS

The Kermadec islands lie between lat. $29^{\circ} 10'$ and $31^{\circ} 30' S$ and long. $177^{\circ} 45'$ and $179^{\circ} 00' W$. They comprise: Raoul (or Sunday) island, with an area of about 7,000 acres; Macauley, Curtis and Cheeseman islands, much smaller in size; and L'Espérance rock, small, rugged and uninhabitable. The islands lie well off all regular shipping routes. Vessels bound from Auckland to Rarotonga or Suva normally approach them most nearly, but they pass about 150 miles to the east and 300 miles to the west respectively. The Kermadecs were annexed to New Zealand in 1887. Their only inhabitants at the

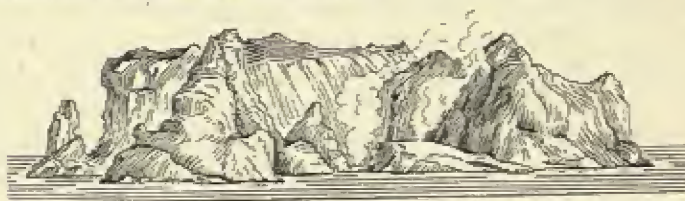


Fig. 112. Curtis island crater

From the north-west, showing the broken-down walls on the seaward side. Based on S. Percy Smith, *The Kermadec Islands* . . . , p. 28 (Wellington, 1887).

present time comprise the staff of a government radio-meteorological station.

PHYSICAL GEOGRAPHY (Fig. 111)

The Kermadec islands are all of volcanic origin. They are situated in the zone of volcanic activity which stretches roughly north-north-east from the Bay of Plenty, in New Zealand, to Tonga and Samoa. Several severe eruptions and earthquakes have been recorded over the past eighty years. In 1872 mud, stones and pumice were scattered widely over Raoul island by an eruption. At the same time a sandy islet was formed in Denham bay. For some time this was large enough to give useful protection to visiting ships, but gradually it was washed away. Detailed observations in 1908 showed minor seismic disturbances occurring at intervals of roughly a month. On Raoul island steam escapes at several points in the cliffs round Denham bay and warm water oozes through the sand on the north coast; and on Curtis island there are many fumaroles (Fig. 112).

Climate

In summer the climate of the Kermadecs is, on the whole, fine and settled, with light or moderate easterly winds. In winter it is often unsettled, owing to disturbances passing over the islands in an easterly direction. Gales—most frequently from the west—occur at all seasons, but on not more than three days a month in summer and six days in winter. Temperatures are slightly higher than those of northern New Zealand. On Raoul island the average for February is 72° F. Detailed records obtained for the period February-October 1908 showed an average monthly temperature varying between 60° F. for August and 74° F. for February. In February the absolute maximum and minimum were 85° F. and 63° F. and the mean daily range 10° F.; corresponding figures for August were 70° F. and 46° F. and the range 12° F. Rainfall is heavy. During the period February-October 1908 it amounted to 66 in. The late spring and summer (November to February) are generally comparatively dry and the late autumn and winter (May to August) rather wet. The lowest average monthly fall is in November (2 in.) and the highest in May (7 in.); but there is considerable variation from year to year. The average relative humidity on Raoul island is about 74 per cent.

Vegetation

At one time the larger islands were probably completely covered with sub-tropical rain forest and evergreen scrub, but the introduction of goats and the arrival of large numbers of non-indigenous weeds have brought about great changes in the vegetation. The non-native flora has not actually ousted the native, but it has taken possession of the ground wherever original forest or scrub has been cleared.

The indigenous flora of the Kermadecs is generally similar to that of northern New Zealand, but there is a still closer resemblance to that of Norfolk and Lord Howe islands, with which the group seems to form a natural botanical province. About 114 native species of flowering plants and ferns are known, of which about a tenth are endemic.

A large part of Raoul island is still forest-covered. Up to a height of 700-1,000 ft. the forest is mainly formed by the tree *Metrosideros villosa*, which with its dark green foliage has a sombre and monotonous appearance except in November and December, when its scarlet flowers make a blaze of colour. It grows about 60 ft. tall. Tree ferns and smaller broad-leaved evergreen trees form a second

storey beneath. There is a rather stanty undergrowth of small ferns, grasses and a few other herbaceous plants. In well-sheltered places there are picturesque groves of *Rhopalostylis Baueri*, a palm known elsewhere only from Norfolk island. Before the goats came, several trees now very rare were common, and the undergrowth was probably much thicker than it now is.

On the higher ground, such as parts of the crater ridge, a different type of forest is met with—dampier and more varied than that at a lower altitude. *Metrosideros* is no longer the dominant tree and the mixture of species gives a greater variety of shades of green. Epiphytic ferns and mosses, which are not conspicuous in the lowland forest, grow everywhere in masses. Tree ferns grow in places to a height of 65 ft. and a thickness of 6 ft. or more, and the palm *Rhopalostylis* is thickly scattered among the other trees.

Other types of native vegetation which cover a smaller proportion of the island than the forest are: the scrub of *ngaio* (*Myoporum laetum*), which forms a belt on the coast just above high-water mark; the close-growing tussocks of the sedge *Mariscus*, on the talus at the foot of the sea cliffs; and a community of rushes and bulrushes in swampy ground in Denham bay and elsewhere. Where the forest was destroyed in the eruption of 1872, a new vegetation sprang up on the pumice tuff, consisting mainly of shrubs, among which the *tutu* (*Coriaria sarmentosa*) is the most conspicuous.

The vegetation of introduced plants is of two kinds. In the clearings about Denham bay the ground is covered by *Ageratum conyzoides*, a blue-flowered plant belonging to the Compositae family. On the terraces, low flats and the adjoining crater-ridge there are dense growths of the buffalo grass (*Stenotaphrum glabrum*), 2-6 ft. high, which are avoided even by the goats and are so thickly intertwined that it is impossible to walk over them.

Macauley island was probably originally covered not by forest but by scrub like that now found on the coast of Raoul island, and by tussock. Whalers burnt the scrub, and the goats they left behind have destroyed all woody plants except in a few inaccessible places. Most of the island is now covered with a parched and close-cropped turf of the introduced grass *Polypogon monspeliensis*. The north-east corner is quite bare.

Fauna

The only indigenous mammal is a small grey rat, which is said now to be much reduced in numbers. Sheep, pigs, goats and cats were

introduced into Raoul island by settlers. The first have now probably all been removed, and the second, always few in number, were formerly confined by the cliffs to the flat land round Denham bay. The goats have multiplied exceedingly. In 1935 it was estimated that there were about 3,000 on the island. Cats also have greatly increased. Land birds are now very few, owing to the depredations of the cats. Most are very similar to species found in New Zealand. Large numbers of sea birds breed on the smaller islands of the group. The principal kinds are albatross, gannet and mutton bird (a shearwater). The last is by far the most numerous and very tame. It lays its eggs on the ground, and the young, which can easily be caught, are cooked for food. The flesh is not unpalatable, though somewhat oily. Turtle and many kinds of fish are abundant off the coast. The former do not breed there but go north to warmer climates.

HISTORY

The Kermadecs were visited by at least one of the canoes in the great migration of the Maori from the Society islands to New Zealand in the middle of the fourteenth century. The voyagers named them Rangitahua, but they did not settle permanently. The European discovery of Macauley and Curtis islands was by Lieut. Watts, of the transport *Lady Penrhyn*, in 1788, and of Raoul island and L'Espérance rock by the French navigator D'Entrecasteaux in 1793. The latter gave the group its present name in honour of one of his captains, Huon Kermadec. Three years after D'Entrecasteaux, Raven, of the transport *Britannia*, sighted Raoul and, believing it to be a new discovery, named it Sunday island, by which name it has until recently been most generally known. Dumont d'Urville passed through the group in 1827, and the ships of the United States Exploring Expedition, under Wilkes, did so in 1840. The islands were surveyed in 1854 by Captain Denham of H.M.S. *Herald*.

Long before the latter date, however, the waters surrounding the Kermadecs had begun to be frequented by whale ships. Raoul island was used by them as a depot where mail could be left to be picked up by any vessel homeward bound; and from time to time sailors had lived ashore there. Such calls provided the opportunity for energetic settlers to build up a lucrative trade in supplying provisions to the ships. In 1837 two Europeans with experience of Pacific trading decided to settle on Raoul for this purpose. They brought with them Samoan wives, built substantial houses of reeds,

and began the cultivation of the soil. They supplied potatoes and other vegetables and firewood to the whalers and cut a road from the shore to the lagoon to enable the visitors to obtain water. After some years, however, they tired of their isolation, and in 1848 the island was again without inhabitants. About two years later an American settler arrived. In 1851 he was joined by a party from New Zealand, consisting mainly of Maori, and the business of supplying the whalers was resumed.

Apart from quarrels among the settlers, affairs proceeded uneventfully for some ten years. Then, about 1861, a labour raider bound for Callao put into the island. Typhoid had broken out among the Tokelau islanders, over 200 in number, who were on board. They were all put ashore, where they were left to die. In the ensuing epidemic more than half the settlers also lost their lives. The remainder abandoned the island.

From this time Raoul island was occupied only for short periods until 1878. On several occasions the settlers left because of the violence of volcanic activity. In the latter year, however, Thomas Bell, a trader from Samoa, arrived with his family, intending to develop trade with the whalers on a considerable scale. But by this time the whaling grounds in the vicinity of the group were largely worked out. The Bell family turned their attention to the breeding of sheep and remained on the island until 1914.

Despite the fertility of the soil, economic activity in the Kermadecs has thus always been on a very small scale. But their isolated position, far off any important trade route, has not made them necessarily unimportant strategically. In 1885 the New Zealand government, fearing the possibility of their falling into the hands of a hostile Power, urged their annexation. Great Britain acquiesced, and in July 1886 Captain Clayton, of H.M.S. *Diamond*, proclaimed British sovereignty at Denham bay. In the following year the group was handed over to New Zealand for administration.

RECENT OCCUPATION

In 1926 and again in 1935 small parties set out from Auckland to settle on Raoul island, with the intention of exporting oranges and other fruit. But, owing to the difficulty in maintaining communications, they met with little success. On the latter occasion it was found also that goats had destroyed the greater number of fruit trees by ring-barking them.

During the war of 1914-18, the group was used by Count von Luckner, commander of the raider *Wolf*, as a place of refuge after his escape from imprisonment in New Zealand. Other similarly isolated islands, such as Easter (vol. II, pp. 71-2), were also resorted to by Germans at that time. For this and other reasons, the New Zealand government regards it as undesirable that private settlers should be admitted. Most of Raoul island, which is alone suitable for settlement, has for some years been a reserve; and the remaining privately owned lands have recently been acquired and added to it. The only inhabitants at the present time are the staff of a government radio-meteorological station, established primarily to assist in the planning and operation of trans-Pacific air services. They live in a settlement near Fleetwood bluff, and run a small farm to supply their own needs.

RAOUL ISLAND

Raoul island (lat. $29^{\circ} 16' S$, long. $177^{\circ} 53' W$) has a coast-line of about 20 miles and an area of 7,260 acres. It is roughly triangular in shape, with Denham bay forming a deep bight in the west coast. The centre of the island consists of a crater $1\frac{3}{4}$ miles long and is $1\frac{1}{4}$ miles wide. The floor of this crater is in places only 40 ft. above sea level. Its walls are generally over 1,000 ft. high and rise at one point, Moumoukai, to 1,723 ft. On the north side, however, they fall as low as 180 ft. Spurs and ridges radiate from the crater rim, ending usually in abrupt cliffs and bluffs. The largest area of flat land is behind Denham bay. It extends for about $1\frac{3}{4}$ miles along the coast and has an average width of about 200 yd. There are smaller flat areas to the east and west of Fleetwood bluff and at one or two other points. But the major part of the surface of the island is made up of sharp ridges and deep gullies.

The soil is formed of decomposed pumice tuff and andesite lava, mixed with fine vegetable mould. It is very rich. But owing to its being excessively porous there is a lack of surface water and an absence of any sizable streams. In the floor of the crater are three freshwater lakes. There is also a small lake, in which the water is slightly saline, near the shore of Denham bay.

Except in Denham bay and on either side of Fleetwood bluff, where there are beaches, high cliffs or bluffs rise directly from the shore. The best landings are at Fishing rock, $\frac{1}{2}$ mile north of Rayner point, and at the north end of Denham bay; landing is also possible in Boat cove, near Nash point, but it is dangerous, owing to the

absence of a beach. At many points off the coast there are rocks with 2 fathoms or less over them, on which the sea breaks. Anchorage is possible, however, on all sides of the island, on a bottom of sand. The anchorages most used lie between Rayner and Wilson points, about $\frac{1}{2}$ mile south of Meyer island, on the east coast, in 14-18 fathoms, and about $1\frac{1}{2}$ miles south of Hutchison bluff, on the west coast, in 12 fathoms.

The Herald islets, a group of eight islets and rocks, lie between 1 and 2 miles east of Raoul island. All are barren except Meyer island, the largest of them, which has an area of about 30 acres. This possesses a rich soil and supports a vigorous growth of trees. Landing is possible on the west side. All the islets are breeding places for great numbers of sea birds.

MACAULEY ISLAND

Macauley island, the second largest of the group, lies about 65 miles south-south-west of Raoul. It is roughly circular, with an area of about 760 acres. The highest point is mount Haszard (780 ft.), at the western end, and from it the land slopes gently down towards the east. The soil is a rich volcanic loam. It is covered with a smooth sward of grass, interspersed with occasional clumps of bushes; and large numbers of goats find sustenance on the island. The shore is backed on all sides by cliffs, ranging from 600 ft. in height in the west to about 200 ft. in the east. They are scalable at Lava cascade. Landing is possible in Sandy bay, which is sheltered by Haszard islet, a high rock about $\frac{1}{2}$ mile off the east coast. A depot for shipwrecked mariners was formerly maintained near Lava cascade, but when last visited (in 1937) it was in ruins.

CURTIS AND CHEESEMAN ISLANDS

These two islands lie close together, separated by Stella passage, about $\frac{1}{4}$ mile wide, some 20 miles south of Macauley island. Cheeseman is a barren rock, supporting only a growth of ice-plant, and inhabited by sea birds. Curtis is larger, with an area of about 130 acres. In the west of the island there is a crater (Fig. 112), which sends forth a considerable amount of steam from numerous fumaroles scattered over its floor. In the north-west the crater walls are broken down, and a warm stream drains into the sea in Macdonald cove. In all other parts of the island cliffs rise perpendicularly

from the shore to a height of from 400 to 450 ft. Landing is possible in easterly and southerly weather in Macdonald cove. A depot for shipwrecked mariners was formerly maintained here, but, like that on Macauley island, it is reported to be now in ruins.

L'ESPÉRANCE ROCK

L'Espérance rock, known as Brind or French rock to the whalers who formerly frequented the seas surrounding it, is charted as 53 miles south of Curtis island, but in 1939 it was reported to lie about 8 miles further to the north. It is barren and desolate, rising steeply from the sea to its summit, which is at a height of about 445 ft.

NORFOLK ISLAND

Norfolk island (Fig. 113) lies in lat. $29^{\circ} 04' S$, long. $167^{\circ} 56' E$. It is roughly 5 miles long and 3 miles wide, with a total area of 8,528 acres, and is about 920 miles east of Sydney. It is a dependency of the Commonwealth of Australia, known officially as the Territory of Norfolk Island. It is of considerable importance as the station where the Trans-Pacific cable from Vancouver, *via* Fanning island and Suva, divides, part continuing to Australia and part to New Zealand.

PHYSICAL GEOGRAPHY

Norfolk island is largely of volcanic formation, consisting of flows of basalt lava lying horizontally and overlaid in most places by a deep bed of lateritic soil. In the south, near Kingston, a bed of limestone runs inland for a distance of $\frac{1}{4}$ mile.

In general the island consists of rolling parkland with an altitude varying from 400 to 500 ft., but rising in the north-west corner to the twin peaks of mount Pitt (1,044 and 1,028 ft. respectively). Streams are few and insignificant, but they have cut valleys or ravines 50 ft. deep or more. Flooding occurs in places where vegetation has overgrown the shallower gullies so that they cannot carry off the occasional heavy rains.

Coasts (Plates 55-57)

While the coast has no deep indentations, it is irregular, with many bays divided by small promontories. Almost everywhere the shoreline is faced with steep cliffs rising to between 300 and 400 ft. on the

north and west sides and to about 200 ft. elsewhere. But round Kingston and near Cascade landing the ground slopes in a series of maturely eroded and dissected downlands to the shore. Gently shelving beaches occur at Sydney bay (where Kingston is situated), east of cape Hunter, and at Cascade bay.



Fig. 113. Norfolk Island

The built-up area in the settlement of Kingston is shown approximately by diagonal shading. Based on: (1) Admiralty chart no. 1110; (2) G.S.G.S. map no. 4317.

Offshore the coast is studded with numerous isolated rocks and with patches of coral reef extending about 880 yd. seaward at the widest point, off cape Hunter. In general the coral is being broken down, as also are the cliffs, by wave action; and it is only in Sydney bay—protected slightly by Phillip island—that there is any continuous reef. There the coral forms a barrier reef enclosing a narrow

lagoon about 1,500 yd. long, with a boat passage 5 ft. deep at high water and a sandy beach in Emily bay at its eastern end.

To the south of Norfolk lie Phillip and Nepean islands. Neither is normally inhabited. Nepean is a small islet about $\frac{1}{2}$ mile south of Kingston. It is of limestone formation and is surrounded by a coral reef. It rises to a height of about 105 ft. Phillip island, 3 miles south of Norfolk, is of volcanic formation. It has a length from east to west of about $1\frac{1}{2}$ miles and rises to a height of 930 ft. in the extreme south, where steep cliffs and scree fall away in the sea. There are low cliffs round most of the rest of the island, and it is fringed by a coral reef; but landing can be effected in a small bay, where there are rocks and some sand. The island is practically bare of vegetation. There were formerly numerous rabbits, but in recent years an attempt has been made to exterminate them. A hut was built on the island in 1937 for the use of the forestry officer when he was undertaking this work.

Anchorage and Landings

There is no good or well-protected anchorage off Norfolk island. Ships lie about $\frac{1}{2}$ mile offshore either in Sydney bay, in from 10 to 12 fathoms, or opposite Cascade bay. Visual signals are hoisted from the signal station near Kingston, advising approaching ships where to anchor.

Norfolk island is badly provided with landings and in stormy weather it is difficult to get ashore. La Pérouse, who sighted the island in 1788, could not find a landing at all, and Lieut. King, when he arrived to settle the island in the same year, took 5 days to find a landing place.

The regular landings are at Kingston and Cascade, but landing can be made if occasion demands in Ball bay where there are steps, in Duncombe bay, and at Headstone where concrete steps have recently been built. There is a path leading up the cliff to the cable station at Anson bay, but anchorage is prohibited there owing to the risk of fouling submarine cables. At Cascade landing, which is most frequently used, the original landing rock has been improved by concrete work to form a jetty for boats to come alongside and a power-operated derrick has been installed. At Kingston there is a stone jetty at the west end of the barrier reef. This is also equipped with a small power-operated crane. A boat passage at the east end of the reef leads to a shelving beach in Emily bay. No ships come alongside either of these jetties but lie $\frac{1}{2}$ mile offshore and discharge into boats.

Climate (Fig. 114)

Norfolk island lies outside the trade wind belt. In summer winds are predominantly from the east; at other times they are very variable. During five years' observations, winds of gale force occurred on an average of 11 days in a year, but over most of the year the island enjoys moderate breezes. Considerable periods of fine and settled weather occur from November to February. During the

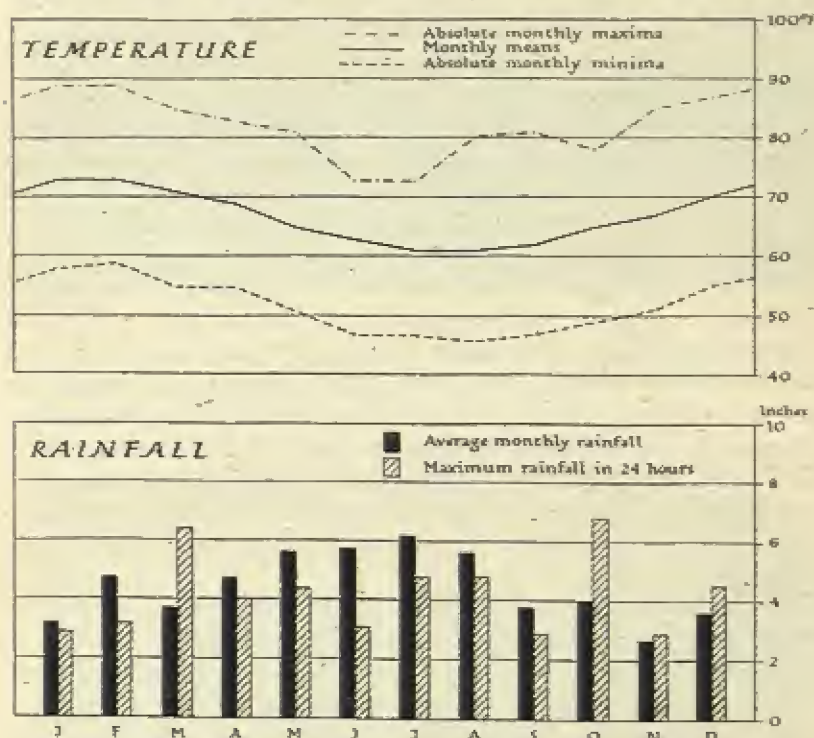


Fig. 114. Norfolk island: temperature and rainfall

Based on *Australia Pilot* (3rd edition), vol. III, p. 246 (London, 1936).

remainder of the year they are not infrequent, though least common and of shortest duration from May to September. Average monthly temperature varies from 61° F. in July and August to 73° F. in January and February. Mean daily variation is from 58° F. to 65° F. in July and from 67° F. to 70° F. in January. The lowest temperature ever recorded (46° F.) was in August, and the highest (89° F.) in January. Rainfall is light, amounting on an average to 53 in. a year,

with most rain occurring from May to July. Over 6 in. have fallen in a single day in both March and October. On the other hand, in an exceptional year, 1937-8, only 9 in. of rain fell between September and March.

Water Supply. Wells can be dug only with difficulty in the lateritic soil. The inhabitants are mainly dependent on rain water.

Vegetation

Norfolk island is chiefly famous botanically as the home of the Norfolk island pine (*Araucaria excelsa*), which because of its beautifully symmetrical growth has become a favourite ornamental tree for indoor cultivation in England and out of doors in warmer climates. The flora of the island is closely related to that of Lord Howe island and the Kermadecs and more distantly to that of New Zealand, with which it shares a considerable number of species in common. In all some 208 species of flowering plants and ferns have been found, many of which are endemic.

At the time of its discovery in 1774 the island was described as being entirely wooded 'without a single acre of clear land'. The forest consisted of various broad-leaved evergreen trees, in addition to tree ferns, the pine and the graceful palm *Rhopalostylis Baueri* (now known as *nikau* by the islanders, the popular name of a closely related New Zealand species). The trees were bound together with creepers, but the forest was free from undergrowth except near the shore, where there were so many shrubs and low-growing plants that it was difficult to penetrate.

Colonization and the development of agriculture have made great changes in the island. Many native species have become rare and at least one entirely extinct. The forest has become reduced to mere vestiges (called 'the stick' by the islanders), its place being taken by grassland and thickets of introduced bushes. The Norfolk island pine is still a striking feature of the landscape, the seeds being collected for export, but the gigantic specimens of former days, some nearly 200 ft. high, are no longer seen. Weeds, many of European origin, are now abundant everywhere and grow with incredible luxuriance, threatening to overwhelm what is left of the native vegetation; four of the most troublesome are the 'tobacco' and another species of *Solanum*, *Cassia Laevigata* (the 'acacia' of the island) and a red salvia. Some cultivated plants, for example the lemon and the two kinds of guava, have run wild and are now serious pests.

The common pasture grass is the introduced *Cynodon dactylon*,



Plate 55. Phillip and Nepean islands

Phillip island, the larger of the two, lies about three miles south of Norfolk island. The photograph was taken from Bloody Bridge, about $\frac{1}{2}$ mile east of Kingston. The trees in the foreground are Norfolk island pines.



Plate 56. Norfolk island from the air

In the foreground is Steel's point. In the distance, on the right, are the twin peaks of mount Pitt. On the horizon, on the left of the photograph, can be seen a line of breakers in the vicinity of Kingston. The photograph shows clearly the general character of the coast and of the gently rolling land of the interior.



Plate 57. Coastal cliffs, Norfolk island

This photograph shows in greater detail the same type of coastal scenery as is shown in Plate 56. Steep cliffs rise from the shore. In the vegetation of the country behind the Norfolk island pine is prominent, rising well above other trees.



Plate 58. Kingston, Norfolk island

A general view of the settlement from the north-east.

which provides excellent fodder. Useful plants native to the island include the New Zealand flax (*Phormium tenax*), the kurrajong tree (*Wikstroemia australis*), the bark of which makes good rope, and the ironwood (*Olea apetala*, a kind of wild olive), a very hard and durable timber. The pine has been ruthlessly exploited; the wood is used for making shingles, but it is not very durable out of doors.

Fauna

Sea birds are plentiful. In 1790 the settlers and convicts on the island lived for five months very largely upon the flesh and eggs of the mutton bird, which then nested in great numbers on the slopes of mount Pitt. Whales visit the coasts of the island at certain seasons, and there is abundance of good fish. The introduced fauna includes horses, cattle, pigs, poultry and rabbits. According to a census of livestock in 1941, there were then on the island 579 horses, 1,624 head of cattle and 357 sheep, besides other animals.

HISTORY

Norfolk island was discovered in 1774 by Cook, who landed there and found it uninhabited. The tall straight pines and New Zealand flax in which it abounded, however, gave it prospective importance as a depot for the supply of masts and cordage for shipping. When plans were being drawn up thirteen years later for a penal colony on the neighbouring coast of Australia, provision was included for the settlement of Norfolk.

Soon after the arrival of the 'first fleet' in Port Jackson in 1788, a small party of soldiers and convicts was despatched to Norfolk island, under the command of Lieut. Philip Gidley King. The settlement prospered. Under King's energetic leadership extensive cultivation of the land was undertaken, and the results compared more than favourably with those obtained on the mainland. By October 1792 there were 104 free settlers on the island in addition to convicts; by 1804 the number had grown to about 1,000. But the absence of adequate anchorages and the shortage of shipping made the maintenance of communication with the mainland difficult; and this isolation in turn made the island unpopular with most of the troops stationed there and created a serious risk of revolt among the convicts. Further, the early hopes of developing trade in flax and timber had been disappointed. In 1804 two new settlements were founded in Van Diemen's Land; and, to provide them rapidly with an adequate population, an order was made for the transfer to them

of all the free settlers on Norfolk. Four years later the removal of the convicts also was undertaken. By 1813 Norfolk island had been completely abandoned.

For thirteen years only occasional whalers landed on the island. But in 1826 it was reoccupied as a place of detention for convicts guilty of fresh crimes during the period of their original sentences. This time the island was developed as a penal settlement only. In 1841 the population was 2,187, of whom no fewer than 1,831 were under detention. These prisoners were, in general, of a very hardened type; and the island became notorious for the acts of brutality committed by them or by their guards. An agitation grew up for improvement of conditions and, eventually, for the abandonment of the settlement. The latter was carried out in 1853.

Plans had already been made for the future of Norfolk. It was to become the new home for the people of Pitcairn, who wished to be moved from their isolated situation (vol. II, p. 83). In 1856 the migration was carried out. The new settlers numbered 194 persons, of whom between 40 and 50 later returned to Pitcairn. The descendants of the remainder form the major part of the present population.

Amongst those who had interested themselves in the welfare of the Pitcairn islanders was George Augustus Selwyn, Bishop of New Zealand and founder of the Melanesian Mission. To Selwyn and his coadjutors Norfolk seemed admirably suited to become the mission headquarters and the site of a college for the training of native teachers. They obtained official consent to the proposal, and the mission remained on Norfolk from 1866 until 1919, when a move was made to the Solomon islands.

In 1844 control of Norfolk island had passed from New South Wales to Van Dieman's Land. After the arrival of the Pitcairn islanders a further change was made. Norfolk island was created a separate Crown Colony, under the control of the Governor of New South Wales. A simple code of laws was drawn up, and the inhabitants were then left to govern themselves. Not until 1895 was an outsider appointed to rule the island and act as magistrate. About this latter year the broader question of its relation to neighbouring British territories was much discussed. New Zealand urged that the island be placed under its jurisdiction; but in London it was considered that the existing ties with the Australian colonies should not be severed. In 1914 Norfolk became a Territory of the Commonwealth of Australia.

PEOPLE

Population

The population of Norfolk island at the census of 1933 was 1,231. By 1942 it was estimated to have fallen to 798. During the intervening years the small natural increase was far more than counteracted by an excess of departures over arrivals. This emigration was caused primarily by the economic difficulties of the island (p. 404); since the outbreak of war enlistment in the armed forces has led to still further departures.

Settlement

The majority of the people live on their agricultural holdings, which are scattered throughout the island. Their houses are of wood, roofed with corrugated iron, and usually containing four or five rooms; furnishings are simple, though many families possess a piano and a sewing machine. The only concentration of settlement is at Kingston (Plate 58); a number of stone buildings erected with convict labour still remain standing. Outside Kingston perhaps the most notable building is St Barnabas church, on the site of the former Melanesian Mission headquarters; its pews are inlaid with mother-of-pearl, and its windows were designed by Burne-Jones.

Physical Type

In 1942 only one of the original immigrants from Pitcairn was still living; but the descendants of the Pitcairn islanders still constitute the major part of the population. Among them there is still some trace of their partly Tahitian ancestry. But intermarriage with more recent settlers from Australia and New Zealand has already made it less evident; and many of them could be taken by those unacquainted with the physical characteristics of their ancestors for persons of wholly European descent.

Language and Culture

During the last twenty years there have been considerable changes in both the language and the general culture of the islanders. The original immigrants from Pitcairn and those born on Norfolk during the early years retained till the end of their lives many of the old ways. Among themselves they spoke the peculiar Pitcairn dialect, a debased form of English compounded with many Tahitian words (vol. II, p. 84). They dressed extremely simply, and went with bare feet

except on Sundays; they subsisted on a very limited diet, in which fish, sweet potatoes and bananas were among the staple items; and they guarded their isolation tenaciously, opposing all attempts to bring new settlers to the island.

More recently much of this has changed. Contact with the Australian mainland is not feared but sought. Both young men and young women often travel to Australia or New Zealand to obtain work. On the island there is much greater interest in economic matters. Fruit and vegetables are produced by many for the export market, while a few run boarding houses or in other ways cater for the tourist traffic. Weekly cinema shows, tennis tournaments, dances and other social functions of a more or less 'sophisticated' kind have the support of the younger people. Only events such as the annual celebration of *Bounty Day* or the remnants of their austere piety (they are divided between the Anglican, Methodist and Seventh Day Adventist churches) provide a link with the still recent past.

ADMINISTRATION AND SOCIAL SERVICES

General Administration

Norfolk island is governed by an Administrator responsible to the Department of External Territories of the Australian Commonwealth Government. Until 1935 he was assisted by an Executive Council, composed in equal numbers of nominated and of elected members. Since that date there has been instead an Advisory Council of eight members, all of whom are popularly elected. The civil establishment includes, in addition to the Administrator, an Official Secretary and Collector of Customs and a small number of other officials. The activities of the administration include, besides normal routine duties, the maintenance of a meteorological station (for the benefit of Pacific air services) and of a demonstration farm.

Law and Justice

The law of Australia extends to Norfolk island, and there is, in addition, a body of local laws. Justice is administered by the Court of Norfolk Island, a court of record with dual jurisdiction. In its 'lower jurisdiction', when it may be presided over by Justices of the Peace, the court's powers are limited to minor cases. In its 'full jurisdiction', which may be exercised only under the presidency of the Chief Magistrate of the island, or of a judicial officer of equivalent or higher rank, it can hear appeals and deal with all offences. Appeal

lies from the court, sitting in its 'full jurisdiction', to the High Court of Australia.

Finance

The only revenue of Norfolk island, when it first became a Crown Colony, was the interest on a trust fund created for the benefit of the then newly arrived Pitcairn islanders. Though circumstances have since changed greatly, public revenue continues to be paid into the Norfolk Island Trust Fund Account and public expenditure to be met from it. Taxes consist primarily of customs duties. There is no income tax, but every male resident between the ages of 21 and 55 years is liable to 15 days' unpaid work a year, or to payment at the rate of 6s. a day in lieu. Interest on investments, profit on the sale of liquor (which is a government monopoly), and a grant from the commonwealth government are the other principal sources of income. Expenditure is mainly upon salaries. In the year 1939-40 revenue (including the commonwealth grant) was £12,957 and expenditure £14,128.

Land Tenure

More than half the total area of the islands was alienated in former years in freehold grants to the Pitcairn islanders and their descendants and to the Melanesian Mission. Present policy is to grant only the leasehold of lands remaining to the Crown. Leases are for 28 years. It is the aim of the administration to stimulate agricultural production, and for this purpose various conditions as to cultivation of the land are attached.

Social Services

The climate of Norfolk island is, in general, an extremely healthy one, though too damp for those suffering from complaints of the lungs. Malaria and other tropical diseases are absent. A government medical officer is stationed on the island. A cottage hospital was established in 1927 and equipped for radiography. It receives a government subsidy. From time to time the administration has made specialist services available to the people, by arranging for visits to the island by Australian medical men.

Education is free and compulsory to the age of 15 years. There are two government schools—one at Middlegate and the other near the cable station at Anson bay—which provide primary and secondary

education. Their combined roll is between 100 and 150. Teachers are obtained by secondment from New South Wales.

When the Pitcairn islanders came to Norfolk they brought their own pastor with them, but they and their descendants have gradually attached themselves to larger religious bodies. At present there are Anglican, Seventh Day Adventist and Methodist churches on the island.

ECONOMICS

Until Norfolk island was incorporated in the Commonwealth of Australia in 1914, it was virtually excluded from what was potentially the most important market for its produce. At the same time the traditional manner of life of the people provided little incentive to strenuous or highly organized economic activity. Fish, wild pigs and pigeons were plentiful; fruit and vegetables could be easily grown; and sufficient money for the purchase of tea, sugar, flour and kerosine could be obtained by whaling at the proper season of the year. Large areas of good farmland, which had been cleared of forest in convict times, remained uncultivated, supporting only a continually spreading growth of weeds. Cattle and horses, introduced at an earlier time, multiplied rapidly, but were of inferior type; and the official policy of providing cheap grazing on common lands tended to perpetuate the existing situation.

At the end of the war of 1914-18, however, government assistance and the arrival of a number of new settlers from Australia and New Zealand brought about a considerable growth in exports. Bananas, citrus fruits and bean seed were grown for the market; and small quantities of wool and hides were also exported. Later a passion-fruit industry was created and a pulping factory established. More recently tung oil trees have been planted.

Fishing has been attempted on a commercial scale, with a view to supplying the Australian market; but it has not been successful. Just before the outbreak of the present war a syndicate was formed to revive the dormant whaling industry.

One of the principal obstacles to commercial development on Norfolk island has been the lack of capital. The prospects are not sufficiently good to attract many Australian investors. In the circumstances, the islanders have formed co-operative societies. At the present time the fruit-pulping factory is operated in this way; and a co-operative dairy factory has been in operation since 1936.

Trade

The most striking characteristic of Norfolk island trade is the permanent excess of imports over exports. In 1929-30, for example, a year of great prosperity, imports were valued at £55,894 and exports at only £33,027; in the depression year of 1934-5 the figures were £26,518 for imports and £8,318 for exports. This position is made possible principally by three factors: (i) the existence of a considerable tourist trade; (ii) the presence among the permanent residents of many retired people, with incomes derived from outside the territory; and (iii) the payment of a considerable proportion of the expenses of the administration by grants from the commonwealth government.

The major part of both export and import trade is with Australia. From about 1927 until 1932 there was also considerable trade with New Zealand. This, however, has since been largely destroyed. In 1932 New Zealand restricted the entry of bananas, in the interests of the banana industry of Samoa (vol. II, pp. 648-50). Since that time Norfolk has suffered also in consequence of the prolonged trade dispute between the New Zealand and Australian governments, which has been concerned primarily with products such as those the island has to export. As a result, regular shipping services between Norfolk island and New Zealand have been suspended; and the import trade has declined along with the export.

For many years bananas were the staple export of the island. They are easily grown and provide a quick return to the grower. But the slump in prices after 1930, together with the restrictionist policy of the New Zealand government, made them much less attractive than they had been. The export fell from 32,003 cases in 1931-2 to 22,836 cases in 1932-3, and to 18,285 cases in 1933-4. The trade has now become of negligible importance. In the year 1939-40 only 438 cases were exported. Its place has been taken by the exports of passion fruit pulp, of which about 200 tons, amounting to 3,386 cases, were exported by the local pulping factory in 1939-40. The same factory has also begun the similar treatment of the cherry guava. The second industry of the island is now the raising of bean seed, of which about 1,500 bushels are exported annually.

Imports follow the general pattern for a Pacific islands community, including textiles, some foodstuffs, tools and machinery, and kerosine and gasoline as fuels.

Currency and Banking

Australian currency is used on the island. The only bank is a branch of the Commonwealth Savings Bank. There is also a post office order system, by which remittances may be sent to the mainland.

COMMUNICATIONS

Sea communication with Norfolk island is maintained principally by the Burns, Philp company, which employs a vessel continuously in a cargo and passenger service from Sydney to Lord Howe island, Norfolk island and the New Hebrides. The normal schedule provides for a voyage to Lord Howe and Norfolk alone, occupying nine days for the round trip, followed by one continuing to the New Hebrides and occupying about eighteen days. There are also occasional calls by other vessels bound to or from Australian or New Zealand ports and, in peace time, by liners on pleasure cruises. A launch provided by the government is used to tow boats between ships and the landings.

Owing to the abundance of labour in convict times, Norfolk island has an unusually good road system (Fig. 113). In recent years, the main roads have been regraded, realigned and metalled; and some new construction has been undertaken. Horse-drawn vehicles are still commonly used, but there are now also about eighty motor cars and trucks.

The island has a postal service and a telephone system. There is telegraphic communication with Australia and New Zealand, *via* the cable station at Anson bay. There is also a W/T station on the island.

LORD HOWE ISLAND

Lord Howe island (lat. $31^{\circ} 35' S$, long. $159^{\circ} 04' E$) lies about 450 miles east-north-east of Sydney. For administrative purposes it forms part of New South Wales and is included in the political electorate of King.

PHYSICAL GEOGRAPHY

In shape, Lord Howe island resembles a crescent, with its concave side facing towards the west and enclosing a lagoon (Fig. 115). It is about 7 miles long and has an average width of about a mile. Together with its off-lying islands it is of volcanic formation. Off the coast

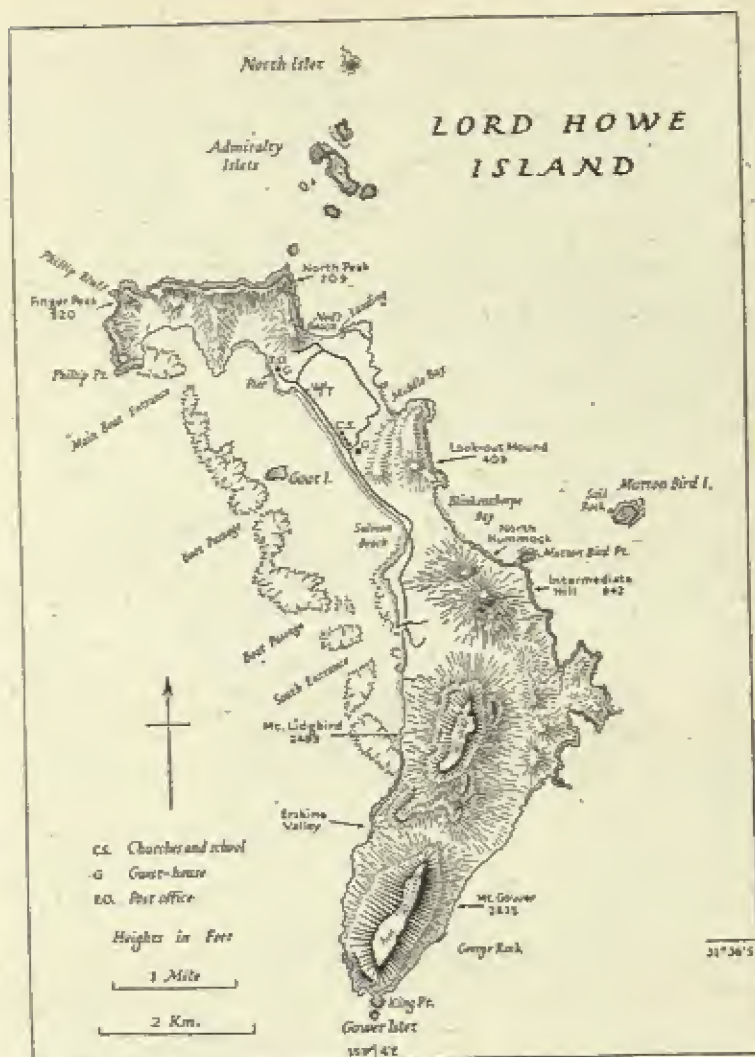


Fig. 115. Lord Howe island

According to recent information the heights of mounts Gower and Lidgbird are 2,840 ft. and 2,504 ft. respectively. The number of guest-houses on the island has increased considerably in recent years. Based on: (1) Admiralty chart no. 350; (2) *National Geographic Magazine*, vol. LXVIII, p. 118 (Washington, 1935).

there are coral reefs—the most southerly occurrence of coral in the world. The north end of the island is formed by a ridge between 500 and 700 ft. high, falling steeply to the northern shore but sloping more gently towards the lagoon. To the south of this is low, rolling country, with a sandy and fertile soil well suited to cultivation. To the south of this again rise mount Lidgbird (2,504 ft.) and mount Gower (2,840 ft.), great masses of rock, shaped like vast truncated pyramids, which dominate the landscapes of the island (Plate 59). These two mountains rise in steep slopes and cliffs almost from the shore. The principal streams of the island have their source in rocky gorges upon their sides.

Coasts, Anchorages and Landings

The east coast, on the outside of the 'crescent', is for the most part characterized by steep cliffs, formed by heavy wave erosion, with isolated off-lying rocks; but there are three short stretches of beach—Ned's beach, Middle beach, and a beach in Blinkenthorpe bay. Off the latter two there are traces of coral. The west coast has the form of a large bay. At both ends the shore consists of cliffs, but over most of its length there is a gently shelving beach of white sand, backed in places by low cliffs 10 ft. or less in height. A coral reef awash at low water stretches across the mouth of the bay. The lagoon thus enclosed is barely navigable for boats at low water, but has a general depth of about 7 ft. at high tide. There are four channels through the reef, of which the middle two are usable only at high water.

There is no good anchorage off the island. A foul bottom and the sudden shifts in the wind to which this region is subject make the areas with suitable depths and at a convenient distance from the shore unavailable. Ships anchor, when possible, on the west side of the island, in 10 fathoms, south-east of Phillip island and 700 yd. from the reef. During south-westerly gales anchorage can be found off the east coast, about a mile east of North peak or $\frac{1}{4}$ mile from Middle beach. As at Norfolk island, visual signals are hoisted to advise ships where to anchor.

In the lagoon there is a small wooden pier, with a hand-operated derrick and a railway track. On the east coast there are no landing facilities, but boats can land at Middle beach or Ned's beach.

There are a number of small islands lying off Lord Howe. The most important are: the Admiralty islets, to the north; Mutton Bird island and Goat island, off the east and west coasts respectively; and



Plate 59. Lord Howe island

This photograph, taken from the slopes of North peak, shows nearly the whole of the island, with the exception of the small northern peninsula. In the foreground is Ned's beach. Between it and the lagoon, on the opposite coast, is the low wooded area in which the homes of the settlers are situated. The houses are screened by the trees. In the background are mounts Litchfield and Gower.



Plate 60. Collecting palm seed, Lord Howe island

The men in the foreground are stripping the seeds from the stalks, while others are climbing the palms for further seed-bearing clusters.



Plate 61. The lagoon, Lord Howe island

The northern peninsula is in the background, and the line of the reef can be picked out to the left of it. In the foreground is a group of islanders returning to their launch with loads of palm seed.

Ball's pyramid, to the south-east. All are rocky and uninhabited. The largest and most remarkable is Ball's pyramid, about $\frac{3}{4}$ mile long and 400 yd. wide, which rises in a knife-edge to a height of 1,816 ft. The waters round it are studded with smaller rocks. Anchorage can be found off Ball's pyramid in fine weather, and in exceptionally good conditions landing can be made on the north-east side.

Climate

The climate is equable and similar to that of Norfolk island (p. 397). Frost is unknown and the temperature seldom falls below 50° F. or rises above 80° F. There is abundant rainfall.

Vegetation

The vegetation of Lord Howe island is remarkable particularly for the abundance of beautiful palms, which are a conspicuous feature of the landscape in all parts of the island. There are four species, all endemic. The most notable of these is the Kentia palm (*Howea Belmoreana*), which, on account of its hardiness, is grown in many parts of the world as an indoor ornamental plant.

Most of the uncultivated part of the island is covered by evergreen sub-tropical rain forest which in favourable situations is about 50-60 ft. high; in exposed places it gives place to low scrub. Up to 2,000 ft. this forest is luxuriant and tropical in appearance, though the undergrowth is never dense. Except for the complete absence of conifers it is not unlike the New Zealand rain forest. It is a mixture of broad-leaved trees, many of which have large buttresses, with tall palms and tree ferns. Lianas and epiphytes are very abundant. The forest is by no means uniform; and four different types, depending on differences of soil, altitude and exposure, can be recognized—lowland high forest, lowland low forest, upland high forest, and upland low forest. In both types of lowland forest *Howea Forsteriana* is the common palm; in the high forest it is overtopped by tall banyan figs and other broad-leaved trees, but in the low forest it is dominant often to the almost complete exclusion of other trees. In the upland high forest *Howea Forsteriana* gives place to *H. Belmoreana* and in the upland low forest to *Hedyscepe canterburyana*.

Above 2,000 ft. the various types of sub-tropical rain forest change to a mossy forest not more than 20 ft. high. Here the palms are *Hedyscepe* and *Clinostigma Mooreanum*, and they and the many tree ferns overtop the broad-leaved trees and bushes. This mossy forest

is almost impenetrable owing to large tussocks of a sedge with razor-edged leaves.

Besides the rain forest and the scrub which grows on the sea coast and on exposed ridges, there are several other types of vegetation on the island, including meadows of sedges and grasses and communities of sand-dune and seashore plants. Steep talus slopes facing the sea are densely covered with tussocks of the sedge *Mariscus hamatodes*. There are a few mangrove trees on the shingle beach, but no actual mangrove forest.

The flora of the island is of great botanical interest, since it has relationships with that of New Zealand and New Caledonia as well as with that of Australia. A third of the species are peculiar to the island, which has evidently been isolated for a very long period.

Fauna

When the island was discovered there were no indigenous four-footed mammals but only a few bats. At various times, dogs, goats and pigs were introduced; and, subsequent to the wreck of a ship, rats came ashore and have multiplied exceedingly to become a serious pest. The bird fauna shows close affinities with that of Australia and some with that of New Zealand. Sea birds are very numerous, including large numbers of shearwaters, terns and noddies. Most nest in the higher parts of the island. Mutton birds, however, are so plentiful that they also make their burrows in the settled lowland, where their young are easily caught to be used for bait by fishermen. Among the land birds are a green pigeon and the rufous-winged moorhen, which is closely allied to the *weka* of New Zealand. The latter is scarce, inhabiting only the more rugged and inaccessible parts of the island. Fish are plentiful in the waters around the island.

HISTORY

Lord Howe island was discovered in 1788 by Lieut. Henry Lidgbird Ball, in the storeship *Supply*, bound from New South Wales to Norfolk island. During the first quarter of the nineteenth century it began to be visited by whalers. About 1833 the island was settled by a small party from New Zealand. These first settlers soon tired of their isolation and left the island again uninhabited. In 1840, however, two families arrived from Sydney and were later joined by others. By 1851 the population of the island had risen to sixteen. The settlers supported themselves by growing fruit and vegetables for the whalers. After about 1870, however, whaling began rapidly

to decline in these seas, and it became necessary to develop some other source of remunerative employment. This was found in the export of the seeds of the *Kentia* palm. For many years the new trade developed haphazardly, but in 1904, with official encouragement, a number of the islanders introduced a scheme for controlling output and prices. An arrangement was made for marketing through an Australian firm, and the producers themselves became members of a co-operative society. This scheme, however, failed effectively to protect the interests of the islanders; with the result that Royal Commissions of investigation were appointed in 1911 and 1912. Their recommendations resulted in the establishment of the present organization of the industry, under an official Board of Control.

Politically, the history of Lord Howe island has been almost without event. From the time of its discovery it was regarded, like Norfolk island, as a dependency of New South Wales. About 1850 it was suggested that it might be used as a convict settlement, but the proposal was not acted upon. For some years the New South Wales government stationed a magistrate on the island, but in 1882 it was placed under the control of a visiting magistrate from the mainland.

SOCIAL AND ECONOMIC CONDITIONS

The population of the island at the census of 1939 was 165. The majority of the people are descendants of the early settlers; but there are at all times a number of 'temporary' residents, ranging from virtually permanent non-natives of the island to visitors on holidays of a few weeks' duration.

The social, political and economic organization of the island revolves round the palm-seed industry. The Lord Howe Island Board of Control, consisting of three New South Wales officials, manages the industry and the general affairs of the island. Local affairs are directed by a local committee of three, elected by the islanders.

Participation in the palm-seed industry is restricted to those born on the island, in order to prevent an excessive influx of settlers from overseas. 'Participants' are organized into a form of co-operative society, of which the profits are distributed according to an elaborate system of share-holding, which takes account of age, size of family and income from other sources. After absence from the island extending over more than six months, participants forfeit their shares, which can only be regained after two months' residence on the island for every year away. The actual collection of the seeds,

normally done by male participants, is not onerous (Plates 60, 61). It has been estimated that it occupies an average of only two hours a week for each active participant. Other sources of livelihood include fruit and vegetable growing and various forms of casual labour. Of the latter the most important is rat-catching. Owing to the damage done by these rodents, the board offers fourpence a head for them; and many thousands are caught every year to earn this bounty. There are also ten guest-houses on the island.

Land is vested in the Board of Control. On marriage an islander is allotted a block on which to build a house, establish gardens and pasture his livestock. The board maintains a general supervision, forbidding the erection of buildings without its consent; but in effect the occupant enjoys a life tenure. Non-islanders are not permitted to hold land.

Direct taxation is virtually non-existent. Non-islanders residing on the island for long periods are obliged to contribute £5 a year to public funds. But the only form of impost upon islanders is the negative one of reducing their shares in the palm-seed industry when they enjoy incomes from other sources. The major expenses of administration are met out of the proceeds from the marketing of palm-seed. The Board of Control supports in this way a school with one teacher, providing primary education, and also a resident doctor and a trained nurse, who care for the health of the people. Secondary education is normally obtained in New South Wales.

COMMUNICATIONS

The only regular overseas communication is provided by the Burns, Philp company's steamer which calls *en route* to and from Norfolk island and the New Hebrides (p. 406).

On the island there are two roads, the 'shore road', following the western coast southward from the pier, and the 'backblocks road', serving the beaches on the east coast. Both are only widened tracks used by carts and sleds. In addition, an elaborate network of foot tracks provides access to most parts of the island. There is a post office and a W/T station, controlled by the postmaster, which communicates with Sydney.

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Also useful are: T. J. McMahon, 'Norfolk Island', *Chambers's Journal*, 7th series, vol. XVI, pp. 39-41 (London, 1926); and R. Knight, 'Norfolk Island', *United Empire*, new series, vol. XXIII, pp. 549-53 (London, 1932). Relief is dealt with by R. M. Laing, 'Notes on the Chief Physiographic Features of Norfolk Island', *Transactions of the New Zealand Institute*, vol. XLV, pp. 323-6; coasts by the Admiralty, *Australia Pilot*, vol. III (3rd edition, London, 1936; with supplement, 1942); vegetation by A. Cunningham, 'Notes on the Vegetation of Norfolk and Phillip Islands', *The London Journal of Botany*, vol. 1, pp. 107-28, 263-92 (London, 1842); J. H. Maiden, 'The Flora of Norfolk Island', *Proceedings of the Linnean Society of New South Wales*, 2nd series, vol. VII, pp. 205-21 (Sydney, 1893-4); birds by A. F. B. Hull, 'The Birds of Lord Howe and Norfolk Islands', *Proceedings of the Linnean Society of New South Wales*, vol. XXXIV, pp. 636-93 (Sydney, 1909-10). Early history is covered by J. J. Spruson, *Norfolk Island: Outline of its History from 1788 to 1884* (Sydney, 1885). Administration and social conditions are dealt with in the annual *Report of the Administrator* (Melbourne, 1915-27; Canberra, from 1928); and more briefly in the *Official Year Book of the Commonwealth of Australia* (Canberra, annually).

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For maps see Appendix I.

Chapter XI

NEW CALEDONIA

Physical Geography: History: Growth and Composition of Population:
Native People: Administration: Social Services

The archipelago of New Caledonia (including the Huon islands, the B  lep islands and the Isle of Pines) and the Loyalty islands and Walpole island lie between lat. 17   and 23   S and long. 162   and



Fig. 116. New Caledonia: reef system
Based on Admiralty chart no. 3033.

169   E, about 900 miles east of Australia and 1,000 miles north-west of New Zealand. Also attached to New Caledonia for administrative purposes are the Chesterfield islands, 285 miles west of the Huon islands. New Caledonia itself, locally often referred to as 'the mainland' (*la Grande-Terre*), is 248 miles long, with an average breadth of

30 miles; its total area is about 6,200 sq. miles. Its dependencies have an additional area of about 800 sq. miles.

Politically, New Caledonia and its dependencies are a French colony, administered by a Governor, who also acts as High Commissioner (*Commissaire général de la République française dans le Pacifique*) in charge of French interests elsewhere in the Western Pacific, including those in Uvea and the Hoorn islands, and in the condominium of the New Hebrides (Chapters VII and XIII).

PHYSICAL GEOGRAPHY

GEOLOGY AND RELIEF

The whole of the archipelago of New Caledonia, from the Huon islands in the north to the Isle of Pines in the south, is encircled by a coral reef of recent formation and constituting essentially a single structural unit (Fig. 116). On the east coast the reef is of the true barrier type, lying off the land at distances of 1-8 miles, with great depths outside it, and a comparatively shallow channel between it and the shore. Much of the reef is awash. A large part of the west coast, in the north and the south, has also a barrier reef, but a considerable section of this coast, in the centre, is bordered only by a fringing reef, often in the form of a platform several miles wide. Both on the east coast and on the west there are numerous passages through the reef, in most cases off the mouths of rivers, where the flow of fresh water, accompanied by the discharge of mud, apparently inhibits the growth of the coral polyp. The greater part of the east coast, except for a section in the centre, is without major indentations, whereas the west coast is deeply indented by bays with many islands. Taken in conjunction with the general contours of the land this suggests that an uneven movement of the land mass has taken place, with greater subsidence on the west. The presence of emerged corals on the eastern side of New Caledonia also points to the same conclusion.

Emerged corals occur on the main island only in the form of a narrow belt on the south coast, about 10 miles long, in the neighbourhood of Yaté. The Isle of Pines, however, consists very largely of this material, and the Loyalty islands almost entirely so.

Though New Caledonia lies along the line of volcanic disturbances in the Western Pacific and is near the New Hebrides, where considerable volcanic activity has taken place, there is no active volcano

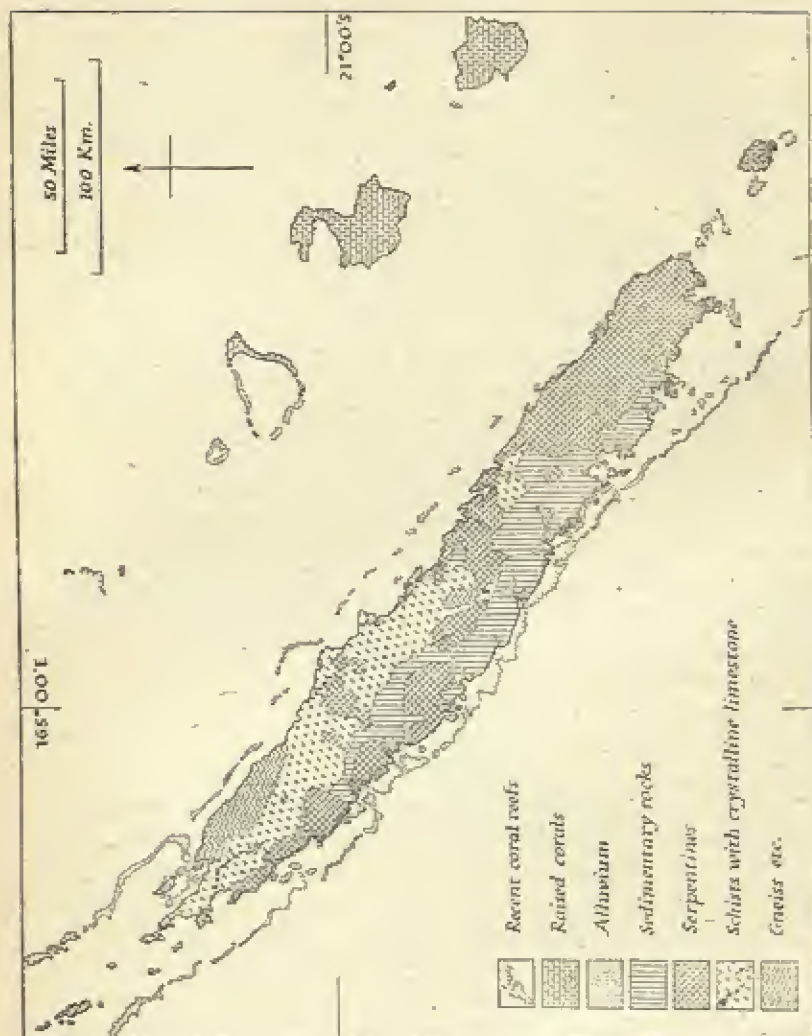


Fig. 117. New Caledonia: geology

Based on: (1) A. Bernard, *L'Archipel de la Nouvelle-Calédonie*, end map (Paris, 1895); R. H. Compton, "New Caledonia and the Isle of Pines", *Geographical Journal*, vol. XLIX, map following p. 160 (London, 1917).

on the island and no volcanic lava or ash has been found. (Earthquakes occur, but their effects are unimportant.)

Both metamorphic and sedimentary formations, however, occur in great quantity (Fig. 117), and the geological structure is important in considering not only the relief of the island (Fig. 118) but also its valuable mineral resources (Fig. 151).

The metamorphic rocks fall into two major groups: gneiss and schists; and serpentine. The principal outcrop of gneiss constitutes the Ignambi chain about 40 miles long in the north-east part of the island, with several main summits. Chief of these is mount Panié, one of the highest points in New Caledonia. Its height is variously given as 5,348 or 5,349 ft. (1,630 m.) and 5,387 ft. (1,642 m.). (If the first figure is correct, it is slightly lower than mount Humboldt, in the south; if the second, it is slightly higher.) On the seaward side, to the east, the mountain chain slopes steeply to the coast with scarcely a break, and the streams which flow in its narrow valleys fall in a series of cataracts, one of the most notable of which is that at Tao. On the landward side, to the west, the descent is also steep, to the valley of the Diahot river. The mountain masses in the rest of the island show a confused series of peaks and ranges, not arranged in any such definite major chain. The schists, which are hard and crystalline, occupy the greater part of the northern and east-central area of the island, the relief of which is here extremely irregular and broken. Towards the centre the rocks consist largely of softer mica-schists, and a more gently rolling landscape is produced. In the north and north-east region, among the schists, there are occasional outcrops of crystalline limestone, semi-translucent and very hard, and assuming in places fantastic shapes of towers and pinnacles (Fig. 128).

The second group of metamorphic rocks, composed largely of serpentine, attains its chief development in the south of the island, though from there it extends in a series of progressively more isolated massifs to the extreme north-west. The southern part of the island in general has a relief of irregular short chains of mountains with very steep sides, separated by narrow stream valleys; the slopes are boulder-strewn, and the summits often take the form of narrow ridges. Among the principal summits are mount Humboldt (5,361 ft.—sometimes given as 5,380 ft. and usually described as the second highest peak in New Caledonia) and mounts St Vincent, Ninga, Mou and Ouin (all approximately 4,000 ft. or more in height). But in the extreme south there is an extensive lowland plain of serpentine earth, known as the Plaine des Lacs, and another in the Isle of Pines.

NEW CALEDONIA



Fig. 118. New Caledonia; relief
Based on same source as Fig. 119.



Fig. 119. New Caledonia; drainage

Based on 1 : 300,000 map prepared by Commandant Laporte for L'Union Agricole Calédonienne and published by La Société d'Éditions Géographiques, Maritimes et Coloniales (Paris, 1903; new edition, 1936).

The more important isolated massifs trending to the north-west are those of Boulinda, Kopeto, Koniambo, Taom, Kaala and Tiébaghi. The whole of the serpentine country, owing to the great amount of iron present, has a characteristic red-ochre colour, which is scarcely disguised by the sparse scrubby vegetation which is dominant over most of the hillsides and ridges below 3,000 ft.

The sedimentary structures are confined to a zone a few miles broad extending along the west coast from the south of the island for about three-quarters of its length. These sedimentary rocks tend to produce a country of broad, gently undulating plains, with some steep-sided hills which do not reach a great elevation. One of the most extensive of these plains is in the region of Fonwary and La Foa. Towards the centre of the island there are two large plateaux, Table Unio and Plateau de Dogny, also of sedimentary formation, but reaching an elevation of about 3,000 ft.

DRAINAGE

New Caledonia has a network of rivers and streams (Fig. 119) which provide for the most part ample and rapid drainage. Many of these rivers rise very quickly in the rainy season—the river Yaté, for instance, which drains a large part of the south of the island and enters the sea through a narrow gorge, has been known to rise 60 ft. in a single night. The large quantities of silt which are brought down at such times are carried out to sea or, more especially on the west coast, are deposited on alluvial plains at the river mouth. A characteristic of streams in the serpentine country is that in dry weather they often run underground for some distance, but in times of heavy rain they utilize a surface course as well.

The largest river in the island is the Diahot in the north, running in the direction of the major axis of the island and emptying into the sea opposite Pam island; it is navigable for small craft for about 20 miles. All the other rivers run approximately at right angles to the major axis of the island and are comparatively short; they are navigable for small craft for only 4 or 5 miles as a rule. Among the most important of them are: the Yaté, the Thio (with its neighbour the Dothio emerging through the same gap), the Negropo, the Houailou (Plate 63), the Ponérihouen, the Tiwaka, the Tipindié and the Hienghène, on the east coast; and the Dumbéa, the Tontouta, the Ouenghi (Plate 62), the La Foa, the Néra, the Voh and the Temala, on the west coast.

and extending for several miles, fall sharply to the sea. From the numerous ravines above the cliffs issue watercourses, one of which in particular, at Goro (Fig. 121), provides a picturesque cascade. Cape Ndoua (Fig. 122), at the extreme south of the island, is a prominent landmark, with its reddish colour characteristic of de-



Fig. 121. Cliffs at Goro

A stream falls in a cascade from the valley on the right. This view may be compared with that in Plate 71. Based on W. M. Davis, *Les Côtes et Les Récifs Coralliens de la Nouvelle-Calédonie*, fig. 12, p. 20 (Paris, 1926).

composed serpentine. To the north-west of cape Ndoua opens the large irregular-shaped Prony bay. It is divided by a promontory, each part having indented shores with small bays to which the hills descend in gentle slopes. Off the coast is Ouen island, separated from the mainland by the gap of Woodin channel, from 1,000 to 2,000 yd. wide. This is the only ship passage; the area to the south of Ouen island is studded with rocks and shoals, rendering navigation difficult and dangerous. Ouen island is rugged, with peaks of heights between 500 and 925 ft.; it is ferruginous and barren except for a few narrow strips of land near sea level. Its coastline is deeply indented; a bay in which the anchorages of Port Kouté and Keumbe



Fig. 122. Cape Ndoua

The signal station is on the high point to the left. Based on W. M. Davis, *Les Côtes et Les Récifs Coralliens de la Nouvelle-Calédonie*, fig. 10, p. 16 (Paris, 1926).

cove are situated penetrates so far as nearly to divide the island. The promontories on the east side of this island end in steep cliffs, whereas those on the west slope easily to the sea.

South-west Coast

From Woodin channel the coast of the mainland trends to the north-west, forming Boulari bay, which, though spacious, has no

commercial importance. The west side of the bay is formed by the promontory of Noumea. In this area, inside the only stretch of barrier reef on the south-west coast, are many islets, banks and shoals, and the lagoon is comparatively shallow. But access to Port Noumea is given by three good channels; all deep and easily navigable.



Fig. 123. Mount Dore

Looking north. Based on W. M. Davis, *Les Côtes et Les Récifs Coralliens de la Nouvelle-Calédonie*, fig. 8, p. 15 (Paris, 1926).

Noumea peninsula, a narrow band of hills running back from it, and some of the islets in the lagoon, are all composed of shales and other sedimentary rocks. But in the vicinity and farther inland are massifs of serpentine formation. Chief of these are mount Dore, 2,543 ft. high (Fig. 123), to the south-east, dominating Boulari bay; the Koghis mountains, with a greatest elevation of 3,540 ft., to the north-east; and mount Mou (4,003 ft.) with two spurs, to the north-west. The general land surface is much eroded, but the slopes descend fairly gradually to the shore. Around Noumea itself the coastline is indented by many small bays. To the north-west of the peninsula is Nou' island, now known officially as Ile Nouville; it is about 3 miles



Fig. 124. Ducos peninsula

From Noumea peninsula, looking north across the bay; Doniambo nickel-smelting works in the foreground. Based on W. M. Davis, *Les Côtes et Les Récifs Coralliens de la Nouvelle-Calédonie*, fig. 5, p. 11 (Paris, 1926).

long. The channel which separates them constitutes Noumea harbour (Fig. 158). Noumea roadstead lies northward of Nou island, between it and Ducos peninsula, on the mainland (Fig. 124). North-west of Noumea and its islands is Dumbéa bay, comprising a number of smaller bays, bounded by Ducos peninsula on the south-east and

Maa peninsula on the west. Opposite Dumbéa bay is a pass in the barrier reef known as Dumbéa passage. Farther to the north-west is Port Laguerre, taking the discharge of two rivers, one being the Paita.

From Port Laguerre the coast runs fairly straight, and is backed by moderately high hills, till Port Uitoë is reached, an inlet enclosed by a chain of wooded islands. A bold peninsula to the north-west, projecting nearly 3 miles out from the line of the coast, separates Port Uitoë from St Vincent bay, a deep indentation in the coast about 10 miles across. The bay, into which the rivers Tontouta and Ouenghi discharge, has marshy irregular shores; shallow approaches and many islands (Plate 64). North and north-east from the head of the bay stand mount Dô (3,327 ft.), a rounded summit, and mount St Vincent (4,741 ft.), a sharp peak. (The height of mount St Vincent

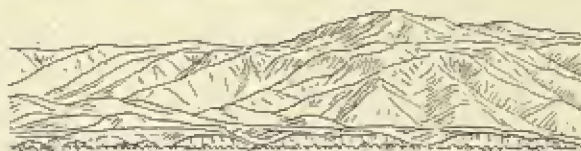


Fig. 125. Poya

Looking north-east; the nickel-mining area (*massif minier*) is in the background. Based on W. M. Davis, *Les Côtes et Des Récifs Coralliens de la Nouvelle-Calédonie*, fig. 41, p. 50 (Paris, 1926).

is sometimes given as 5,069 ft. or 5,076 ft.) Opposite the bay is St Vincent passage, an opening in the barrier reef.

West Coast

From St Vincent bay the coast runs to the north-west until Uarai bay, the outlet for La Foa river, is reached. This is the north-west extremity of the lagoon waters contained by the barrier reef in this region. Beyond Uarai bay the reef is of the fringing type, mainly submerged, with a depth of 6-8 ft. of water over it. To the north-west again lies Bourail bay, a spacious harbour about 3 miles in length and 1 mile across off the entrance. The town of Bourail stands near the Néra river, which with its delta in the head of the bay is of considerable size. The coastline here and for some distance to the north-west has hills standing close to the shore, but the interior (Plate 66) is characterized by rolling plains, rising to tablelands towards the centre of the island and providing wide pasture areas for cattle. To the north-west of Bourail bay are Poya bay, bordered

by cliffs on either side (Fig. 125), and Port Muéo, backed by fairly high mountain ranges with slender peaks rising in places from their rounded summits. From Port Muéo the coast trends in a north-west direction to Koné bay and Kataviti bay, which are together about 6 miles long and 2-3 miles wide. They are sheltered to seaward by Koniène flat, a large isolated reef. Mount Koné, 778 ft. high, stands eastward of the head of Koné bay, into which the Koné river discharges. To the north-west again is Duroc passage, where the navigable waters of the north-west section of the barrier reef begin. A channel branching off to the east leads to Vouavouto cove, outlet for the Voh river. North-east of Duroc passage stands mount Katepahié (2,213 ft.), with jagged sides and flattened top, and to the east is Kafeate, a reddish stretch of high ground rising from a large plain, with a sugar-loaf peak 866 ft. high. Along the coast to the north-west of Vouavouto there are extensive areas of flat land, rising abruptly to isolated peaks and domes (Fig. 126). They include Tsiba peak (1,565 ft.), mount Ouazangou (2,821 ft.), and Homédeboa peak (3,074 ft.). Ounda point, with the meat-preserving works at Ouaco (Plate 67) to the north-east, and Gomen bay, 8 miles to the north-west, are the main coastal features here.

North-west Coast

Farther still to the north-west the flat coastal belt becomes narrower, and the land rises into a series of broad flat-topped domes of serpentine, alternating with zones of folded sedimentary rocks



Fig. 126. Ouaco

Looking north-east. Based on W. M. Davin, *Les Côtes et Les Récifs Coralliens de la Nouvelle-Calédonie*, fig. 42, p. 53 (Paris, 1926).

eroded in undulating depressions. The domes, of which the Kaala mountains, of a maximum elevation of 3,560 ft., and Tiébaghi, 2,001 ft., are the chief, are worn into many small ravines. Though for the most part the coast has little flat land, the slope from the hills to the shore is fairly gradual. Beneath the dome of Tiébaghi is the bay of Port Paagoumène (Fig. 153). Cape Tonnerre, north-west of Paagoumène point, is surmounted by a hill 755 ft. high, and forms the southern extremity of Néhoué bay, an opening of considerable extent but largely occupied by coral reefs. To the north of Néhoué bay is Tanlé bay, said to be the only place on the north-west coast of New Caledonia where a vessel can withstand the force of a hurricane. Beyond is Poume peninsula, a level, fairly broad massif 1,368 ft. in greatest elevation, joined to the mainland by a narrow isthmus. Between Poume peninsula on the south and Arama (Bouabondo) peninsula on the north is Banaré bay, about 6 miles long and 2 miles in average breadth, with shores indented and fringed with coral reefs.

Northern Islands

Néba island, off the bay to the north-west of Poume peninsula, and Yandé island, farther north-west again, are essentially continuations of the mainland massif, with the low land between them submerged. Yandé presents a smooth, steep cliff face to the east and a gentle slope to the west; it has an elevation of 1,070 ft. In further continuation of the mainland ridge to the north-west are the Bélep islands, a group running in a north and south direction for 23 miles and comprising two large islands, Art and Pott, and several smaller ones. Art and Pott are bold and steep on the east side, and of easier slope on the west side, with small bays. Art, the largest island, rises to a height of 728 ft. at the south end. To the north of Arama peninsula lies Baaba island, separated from the mainland by a very narrow channel, and with several small islands on the west side of it.

North Coast

From Baaba island the coast turns to the south-east till a wide, deep opening is reached, comprising Harcourt bay, to the west of Pam island, and Pam bay, between Pam island and the mainland. This opening is an extension of the valley of the Diahot river, which drains an extensive valley and which has a considerable delta. The deposits of silt from the Diahot extend beyond the visible delta for some distance out into the bay, tending to diminish its depth, and rendering the waters of Harcourt bay markedly turbid. Here the

character of the coast begins to change, as the domed serpentine massifs of the west are replaced by the more rugged gneiss mountains of the east. Around Harcourt bay the coastline is fairly flat, with hills at the back, but towards the head of Pam bay it becomes higher and more broken. To the west of the bay rises Arama peak, 1,345 ft., the northerly termination of the ranges to the west of the Diahot, while Nendiaran point is the abrupt mainland termination of the mountain chain on the north-east side of the island. A continuation of these mountains, at a lower altitude, is seen in Pam island and Balabio island. Pam island, about 3 miles long and very narrow, is traversed throughout its length by a chain of hills attaining a greatest height of 561 ft. Balabio island is $7\frac{1}{2}$ miles long and 2 miles wide at its broadest part, and rises in the centre to 925 ft. It is wooded, and the western side is bordered by mangroves and swamps; extensive reefs surround and lie off it.

North-east Coast

For about 30 miles from Nendiaran point the coast trends irregularly to east-south-east, with a number of small inlets, from which streams discharge into the sea, resulting in corresponding breaks in the fringing reef which here lines the shore. The mountain ranges are not far back from the coast, but small coves with stretches of fairly level land at intervals, as at Balade, Puébo and Oubatche, have provided room for settlement. It was in this vicinity that Cook made his landing; at Balade the French took possession of New Caledonia in 1853; and on Poudiou island a few miles away Captain Huon de Kermadec is buried.

Off the coast the barrier reef, broken by a number of passes and known successively as Colnett, Seine, Pouma and Balade reefs, and Amoss flat, stretches for a total length of 29 miles. To the north again for about 100 miles stretches Cook reef, presenting a continuous line of breakers with a few inaccessible openings. After the navigable break of the Grand passage this barrier and the corresponding French reef on the west side continue and merge as the D'Entrecasteaux reefs (p. 508).

Beyond Oubatche to the south-east the height of the mountains increases and the coast becomes more rugged, till at cape Colnett, the first land seen by Cook, the mountains in the immediate vicinity are nearly all sharp serrated ridges about 4,600 ft. high. Behind lie a number of peaks over 5,000 ft. in altitude, including mount Panié. The mountains present to seaward high valleys, closed in towards

the coast by rugged spurs, ending abruptly in steeply inclined cliffs. From the valleys and ravines descend small streams, many in cascade form, the most beautiful being the Grand Cascade near Tao. This structure persists for some distance beyond cape Colnett, but



Fig. 127. Hienghène bay

Looking west. Based on W. M. Davis, *Les Côtes et Les Récifs Coralliens de la Nouvelle-Calédonie*, fig. 32, p. 43 (Paris, 1926).

gradually the mountains decrease in height, and the coast opens out. Near the Ouaième river the summit of the range reaches 3,248 ft. But towards Port Hienghène the altitude is little more than 1,000 ft. and the slope towards the sea is moderate, with a fertile strip of flat land at the shore. Port Hienghène itself (Fig. 127), an indented bay with the appearance of a drowned valley, is remarkable for the crenellated limestone pinnacles (Fig. 128) which appear in the vicinity over a distance of several miles. The Towers (Tours de



Fig. 128. Limestone pinnacles near Hienghène

Looking south-west. Based on W. M. Davis, *Les Côtes et Les Récifs Coralliens de la Nouvelle-Calédonie*, fig. 30, p. 41 (Paris, 1926).

Notre Dame), 262 ft. high, are the best known of these, since they mark the eastern entrance to the port.

East Coast

From Hienghène the coast runs south-east and then east to cape Touho (called cape Porcupine by Cook), passing the Tipindié river. The mountains here are of low elevation, with a moderate, straight

slope to the shore. Cape Touho, a conspicuously prominent headland, is dominated by a hill 1,558 ft. high. Touho passage, about 2 miles east of cape Touho, is the finest channel in the barrier reef on the east side of the island. It has a width of about 5 miles. Beyond cape Touho the coast becomes more indented, a series of projecting capes forming wide bays. The first of these bays is about 12 miles across to cape Baye; it is backed by a number of small green hills, with low land between, and sandy beaches. Cape Baye is an extensive projecting mountainous headland, the apex being divided into two hills about 1,300 ft. high. A smooth, gentle slope about $\frac{1}{4}$ mile wide separates the foot of the mountain from the sea. Another wide bay opens between cape Baye and cape Bocage, a prominent headland composed of a steep-sided hill nearly 1,400 ft. high, connected with the mainland by a low isthmus. Inland from the bay is a considerable extent of level open country, drained at intervals by the Tebamba, the Ponérihouen, the Mou and the Monéo rivers, with rising ground

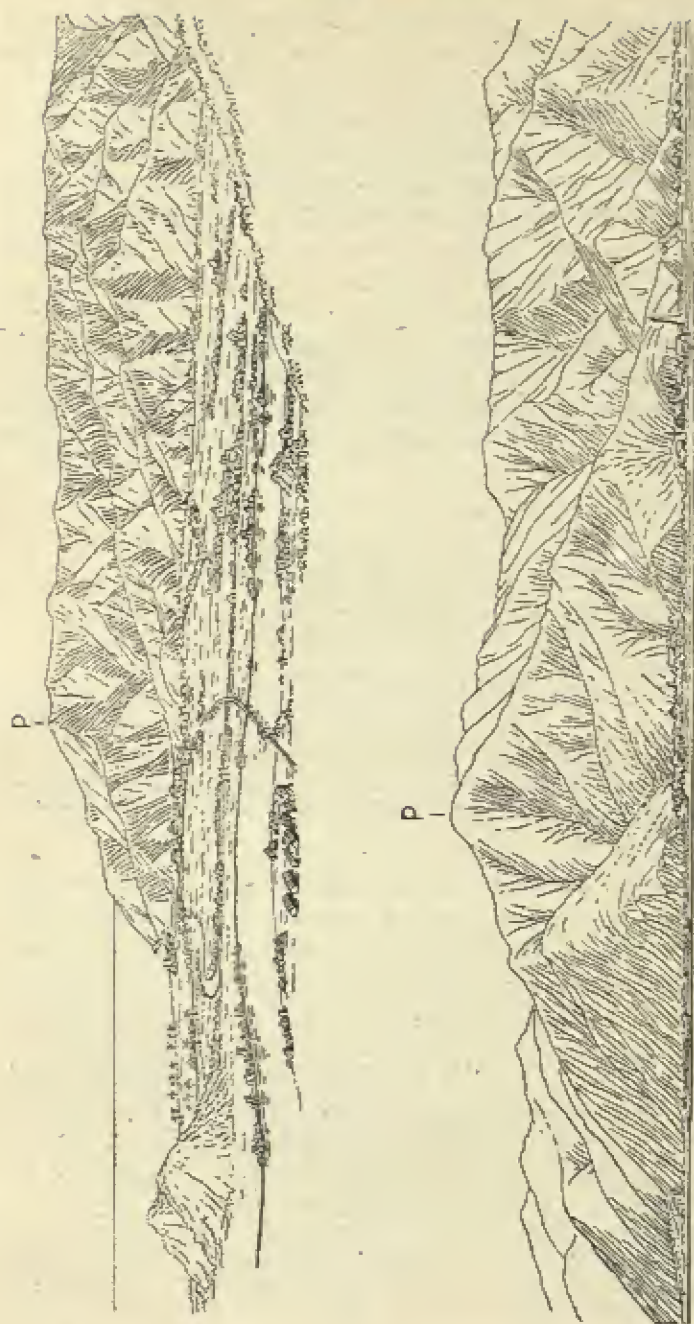


Fig. 129. Cape Laugier

Looking south-east. Based on W. M. Davis, *Les Côtes et Les Récifs Coralliens de la Nouvelle-Calédonie*, fig. 22, p. 36 (Paris, 1926).

between. The Ponérihouen river has 10 ft. of water at the entrance at low tide, and is frequented by coasting vessels. On the south side of cape Bocage lies Bâ bay or Lebris bay, about a mile wide at the entrance and bordered by low hills of easy slope. A little to the south-east is the mouth of the river Houailou, which debouches from a region of comparatively low land in the interior. Houailou head, to the south-east, is a hill only 577 ft. high, and from it extends a sandy beach as far as cape Trois Sapins. Poro bay occupies the eastern half of the bight between cape Bocage and cape Trois Sapins.

A little farther to the south-east the land near the coast rises again, as the serpentine structure appears once more. On the short promontory which separates Kouaoua bay from Laugier bay, the peaks vary from 1,230 to 1,745 ft. in altitude, and fall in steep slopes (Fig. 129) to the shore. Kouaoua bay, about a mile wide at the entrance, is open to the north-east, and Laugier bay, immediately to the east of it, extends nearly north and south; both are fairly



Figs. 130, 131. Thio delta

The top view looks south across the delta. The bottom view gives more detail of the mountains on the eastern side, with Thio mission station on the right. The peak marked p is the same in both views. Based on W. M. Davis, *Les Côtes et Les Récifs Coralliens de la Nouvelle-Calédonie*, figs. 18, 18 bis, pp. 28-9 (Paris, 1926).

narrow. Laugier bay is bounded on the east side by cape Bégat, whence the coast trends to the bay of Canala, the deepest of the indentations on this side of the island. Canala bay, about 6 miles in length and 1 mile wide at the entrance, has a coastline broken by numerous coves, and is the outlet for two rivers of some importance, the Canala in the south-east angle and the Negropo on the west. Both enter the sea through extensive delta flats, and have their sources beyond a plateau in the mountain ranges of the interior of the island. The mountains round the bay rise to 2,000 ft. or so and are eroded into deep valleys.

On the east side of Canala bay is Bogota peninsula, a mountain mass with elevations of over 1,200 ft., terminating in cape Dumoulin, with the summits of Canala (3,484 ft.) and Nakada (3,894 ft.) in the background. East of the peninsula for nearly its whole length



Fig. 132. Tonnedou delta and adjacent coast

Looking north-west. The river enters the sea near Port Bouquet. The delta is well wooded. Based on W. M. Davis, *Les Côtes et Les Récifs Coralliens de la Nouvelle-Calédonie*, fig. 17, p. 26 (Paris, 1926).

lie Bogota reefs, enclosing a lagoon about 5 miles long by 1 mile broad, on the shore side of which are a series of coves, each with a sandy beach. South-east of Bogota peninsula lies Nakéty bay, a deep indentation in the coast, divided by Nani island into two parts, the northern being known as Lavaissière cove. The Nakéty river, with a bar at the mouth, enters the south-west part of the main bay.

From Nakéty bay the coast continues to the south-east, being bordered by a high mountain range showing the red earth of decomposed serpentine on top; from this range cliffs fall steeply to the sea. A breach in the line is made by the Thio valley, occupied by an alluvial plain about a mile broad, formed by the joint deltas of the Thio and Dothio rivers (Figs. 130, 131). The land is high and deeply eroded around the mouth of the valley, while farther in the interior it forms an undulating plateau of about 2,000 ft. altitude. Thio

roadstead, off the valley mouth, is formed by a chain of reefs which run from the northern point of Neuméni peninsula. Farther to the south-east is Port Bouquet, a harbour nearly 6 miles in length and 2 miles wide, formed by Neuméni peninsula, Toupéti island, and a large reef. Toupéti island, of pyramid form and 1,116 ft. high, is a prominent feature of the coast, being very steep on the east side. The Tonnedou river, with a large delta (Fig. 132), runs into the harbour.

South-east Coast

The coast in this region continues to be of fair elevation, over 1,000 ft., with a succession of cliffs or steep slopes falling to the sea. But in form the mountains are much less broken than in the north, and their summits are gently rounded; for the most part they have only scanty vegetation. Occasional bays break the line of the coast, the most important being Kouakoué bay, Ouinné bay, Pourina bay



Fig. 133. East coast near Yaté

Looking south-west. At the mouths of the valleys there are fans of alluvium on the narrow plain behind the fringing reef. Based on W. M. Davis, *Les Côtes et Les Récifs Coralliens de la Nouvelle-Calédonie*, fig. 13, p. 21 (Paris, 1926).

and Port Ounia. The last is a bay into which two small streams discharge from deep valleys close together. Farther still to the south-east is Port Yaté, the estuary of a large river emerging from a sinuous valley.

Inland from Yaté there is a large elevated plain which towards the south breaks up into a fissured mass with confused summits, giving place again near the south of the island to the lowland Plaine des Lacs. The high land near Yaté runs down to the coast in a succession of inclined cliffs, interspersed with narrow valleys, often left hanging at some height (Fig. 133). At the foot of the cliffs is a narrow belt of shore plain, some 10 miles long and 1 mile broad, constituted of the emerged corals of a former fringing reef.

The coast runs with no significant break south to cape Queen Charlotte and Port Goro, formed by an extension of reefs. Immediately to the south-east of cape Queen Charlotte is Havannah passage, the main entry through the mass of reefs stretching between

the mainland and the Isle of Pines for vessels coming from the northward or eastward to Noumea. Sarcelle passage lies about 12 miles to the south-east again. To the west of Port Goro lie two small indentations, Port Koué and Port Boisé, the latter being a perfectly enclosed anchorage. A little to the west again cape Ndoua is reached.

HARBOURS AND ANCHORAGES

New Caledonia has a few good harbours, those of Noumea, Tanlé bay, Ohope bay, Prony bay, Harcourt bay and Bourail bay being among the best. There are many anchorages of medium quality, most having a muddy bottom.

At the south end of the island Prony bay offers good protection. The depths are considerable, but anchorage can be obtained in various parts in 12-14 fathoms, the most convenient being in Sébart cove. Iré bay, on the north of Ouen island, offers shelter from the heaviest gales, with anchorage in 9-11 fathoms.

On the west coast beyond Noumea (pp. 487-9) there is good anchorage in moderate depths in Dumbéa bay, though it is open to the south-west and foul in the eastern half. St Vincent bay has large open areas for anchorage in 5-16 fathoms, and Uarai bay, sheltered on the west by a large reef, has good anchorage in 4-6 fathoms. Good anchorage is given by Bourail bay in any part, though the north-west section is best on account of the absence of swell. Gomen bay gives good shelter in easterly winds, but is shallow, with a soft muddy bottom, and is unsuitable in north-westerly and westerly winds. Of more moderate quality are Port Laguerre, Port Uitoe, Moindou bay, Poya bay, Port Muéo and Ounda bay. The last, which is the shipping port for the Ouaco meat factory, has anchorage in 4-5 fathoms, with a jetty about 400 yd. long running out from the shore.

On the north-west coast there are several good anchorages. Tanlé bay provides very sheltered anchorage in the southern part and Ohope bay, on the western side of Poume peninsula, is easy of access and gives protection against the prevailing winds, though subject to heavy squalls from east or north-east. At Port Paagoumène (Plate 65), whence chrome ore is shipped, there is anchorage in 7 fathoms. In Banaré bay the best anchorage is on the northern side of Poume peninsula, but there are other anchorages elsewhere giving protection from south-east winds.

In the Bélep islands there are several anchorages, the best of which



Plate 62. Ouenghi river, New Caledonia

The view shows the tortuous course followed by many of the rivers of the west coast in their lower reaches.



Plate 63. Houailou river, New Caledonia

A few houses of a native village and the characteristic *Araucaria* pine can be seen. The photograph was taken in 1935.



Plate 64. St Vincent bay, New Caledonia

The coastline here is deeply indented. In the centre is Presqu' ile Montagnes, with the mouth of the Tamoia river on the lower right.



Plate 65. Paagoumène, New Caledonia

This is the port from which chromite is loaded from the Tiébaghi mine. The Tiébaghi massif rises to the left.

is Aue bay at Art island; this is a deep indentation, with good holding ground in 10 fathoms.

On the north side of the mainland anchorage can be obtained in Harcourt bay, the best being in 7-8 fathoms on the east side, in stiff white mud. Pam bay, except in south-east winds, is poor owing to banks of silt from the Diahot river which prevent a large vessel from going far in.

On the east side of the island anchorages are in general exposed to north-east winds, and some are little more than open roadsteads. Port Puébo, in the north-east, is a small inlet giving anchorage in 7-13 fathoms, with good holding but exposed to swell from north-east winds. Port Hienghène is also exposed to north-east and north winds, but gives fair shelter from south-east winds, though it is not advisable to go far in. Between cape Touho and cape Baye there is good anchorage at Wagap and about 3 miles west of cape Baye. At Houailou the anchorage is indifferent, but in Poro bay a good anchorage perfectly protected from the sea is to be found. Kouaoua bay is open to north-east winds, and the most sheltered position is in the south part. Laugier bay, adjacent, is deep and safe except at the head, but is open to the north-west; it is sheltered from east winds. Canala bay is more adequate than most other anchorages on this coast, providing three or four secure positions, the best being at the south end. Nakéty bay is open to the north-east with a heavy swell with such winds, but Lavaissière cove is well sheltered, anchorage being obtained in the south part near a sandy beach on a coral bottom. Thio roads are narrow and open to north and north-east winds which hamper loading, since lighters must be used. At Port Bouquet anchorage can be taken in any part where there is swinging room, in 11-16 fathoms; there is a pier with 30 ft. of water alongside, but it was in a ruinous condition in 1938.

On the south-east coast Ouinné bay, open to the north and north-east, has anchorage in 19 fathoms, with good holding ground; Kouakoué bay is better, there being no swell in the south-east part during east winds. There is rock, however, in the inner part of this bay. At Port Ounia the best anchorage is in the centre; here is complete protection from north-east winds, but it is exposed to the seas raised by north-west or west-north-west winds. At Port Yaté the estuary runs in for about a mile, but the navigable channel is narrow and difficult. Port Goro, where the best entry is by the western (Taemo) passage, offers anchorage in 10-11 fathoms; Port Boisé, an enclosed

anchorage, offers good holding ground in 14-16 fathoms, and has a wooden pier.

Apart from those described above, there are also a number of anchorages between the mainland and the barrier reef.

CLIMATE

The climate of New Caledonia is very suitable for European residence. Though tropical, it is not excessively hot or damp; it is

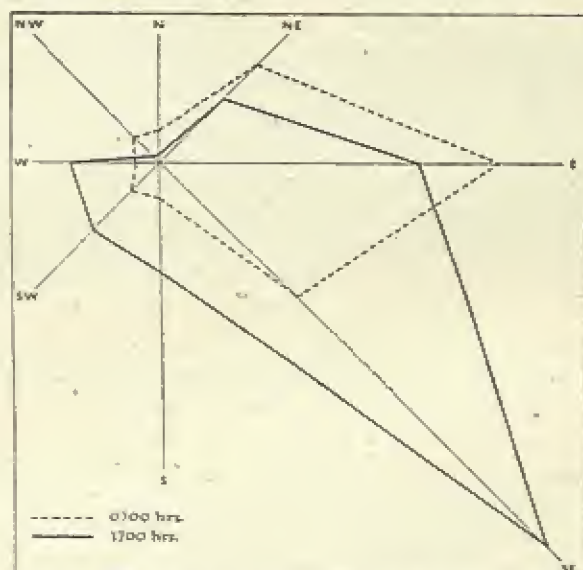


Fig. 134. Annual distribution of winds at Noumea, 1935-8

For general explanation see Fig. 37. Note the prevalence of winds between east and south-east, modified in the morning by the land breezes. Based on P. Suraud and H. Schmidt. 'Climatologie de la Nouvelle-Calédonie', *Proceedings of the Sixth Pacific Science Congress*, p. 725 (Berkeley and Los Angeles, 1940).

sunny, and for the most part it is tempered by frequent light breezes. The most pleasant months of the year are from April to November.

The prevailing winds are the trades, from the south-east and east. In general, from January to April the winds prevail from the east, but may be variable, with rain and storms; in May and June they are fresh and more irregular, with frequent squalls; and from July to October there are regular moderate breezes, at first from the east-south-east, but becoming more south-easterly in the later months and accompanied by fine, dry weather. These winds are occasionally

interrupted by squalls from the south-west or south. About the middle of November strong breezes and squalls begin, with rather more south-westerly winds.

But the force and the direction of the wind are apt to vary very much in different parts of the island. In the north, where by reason of their latitude the trade-winds are better established and where the land is lower and narrower than in the rest of the island, the trades are stronger and more continuous than elsewhere. Nevertheless, in this region violent storms from the west occur in September and October; they are preceded by a dead calm and dull, misty

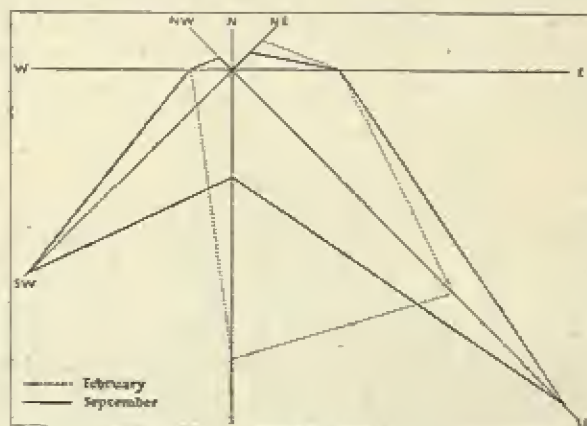


Fig. 135. Monthly variation of winds at Noumea, 1935-8

Winds from the south-east are generally prevalent, but in the later months of the year (illustrated by September) there is a considerable proportion of winds between south and south-west. Based on P. Suraud and H. Schmidt, 'Climatologie de la Nouvelle-Calédonie', *Proceedings of the Sixth Pacific Science Congress*, p. 727 (Berkeley and Los Angeles, 1940).

weather. In the south, while winds from the east and especially south-east prevail in the open sea, they are often deflected along the coast; squally breezes from west and north-west may even occur (Figs. 134, 135). Havannah passage, at the southern extremity of the island, is subject to frequent changes of wind. While the diurnal alternation of land and sea breezes is normal on the west coast, as at Noumea, the east coast is generally swept both day and night by a breeze from the sea.

From the end of December to the middle of April, but particularly in January, February and March, cyclones may occur. These are rotatory storms of small area, and those which cross the centre of

the island may not be felt at the extremities. But all parts of the island are subject to them, though on the average they occur not much more than about once or twice a year. They travel in a southeasterly direction, though sometimes the great extent of elevated land tends to modify their course. At times they are very destructive.

There is no very marked seasonal variation of temperature (Fig. 136), though a comparatively cool season, with fresh nights, is experienced between June and September. The average temperature, which is then about 70° F., rises gradually until in January and

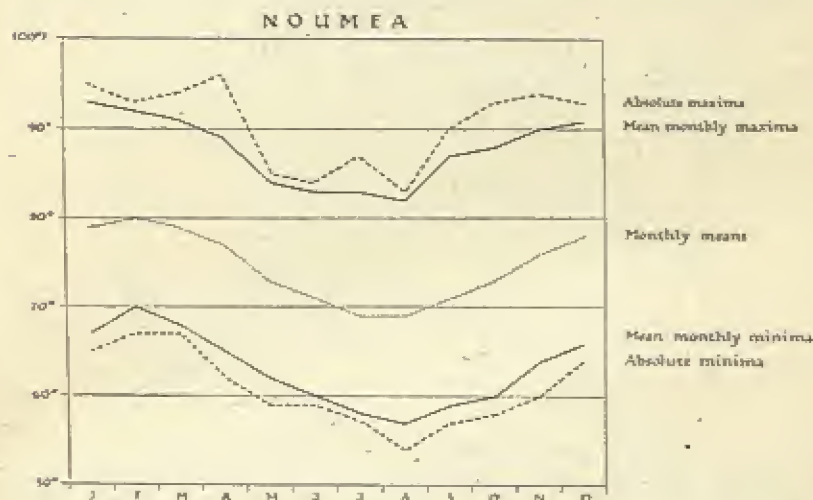


Fig. 136. Monthly temperatures, Noumea

An average of observations over 5 years. Based on *Admiralty Pacific Islands Pilot*, vol. II, 6th edition, p. 510 (London, 1931).

February it reaches a level of about 80° F. Over the whole of the year temperature rarely rises very much above 90° F. or falls very much below 60° F. There is often considerable variation within this range, however, between day and night temperatures, especially on the west coast.

Humidity is fairly low, for a country lying for the most part within the tropics. Average humidity over the whole year is about 75 per cent., and the monthly means are lowest during the period from September to December. Cloudiness is not great. The highest mean values, about 6-tenths cloud, are found in March and April,

and the lowest, about 4-tenths cloud, in October. The sky is covered on the average for about 73 days in the year, and is cloud-free on the average for about 72 days.

Rainfall is very variable in different years (Fig. 137) and in different areas (Fig. 138). Three main regions can be distinguished. The south-east and south coasts, from Yaté to Plum, being most exposed to the trade winds, are the wettest on the whole; the west coast, from Noumea to the north-west extremity of the island, being on the lee side, is the driest; and the east coast, from Thio northwards, has

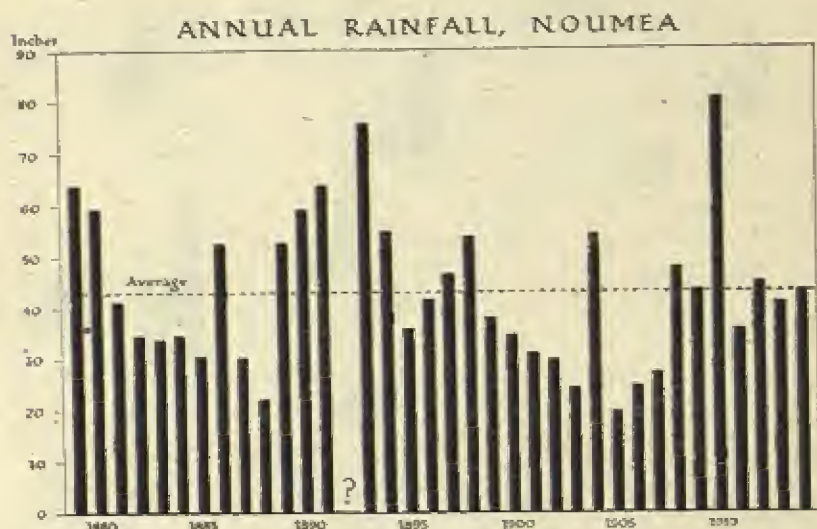


Fig. 137. Annual rainfall, Noumea, 1879-1914

The question mark indicates lack of data. Based on G. Schott in *Handbuch der Klimatologie*, Bd. IV, Teil T, p. 111 (Berlin, 1938).

a medium rainfall. On the whole, there is a comparatively dry season from about August to November, and a comparatively wet season from about December or January to April. But monthly rainfall tends to show great variability from year to year. At times the fall is very heavy, especially on the south-east coast; during the period 1935-8, for instance, the greatest rainfall in 24 hours was about 9 in. at Noumea and about 25 in. at Yaté. But droughts, especially on the western side of the island, are by no means uncommon; as a result of one late in 1941, for instance, many cattle died.

Some meteorological records have been kept by private observers in New Caledonia for many years, but a government meteorological service was not set up until 1938; the technical personnel arrived in 1939.

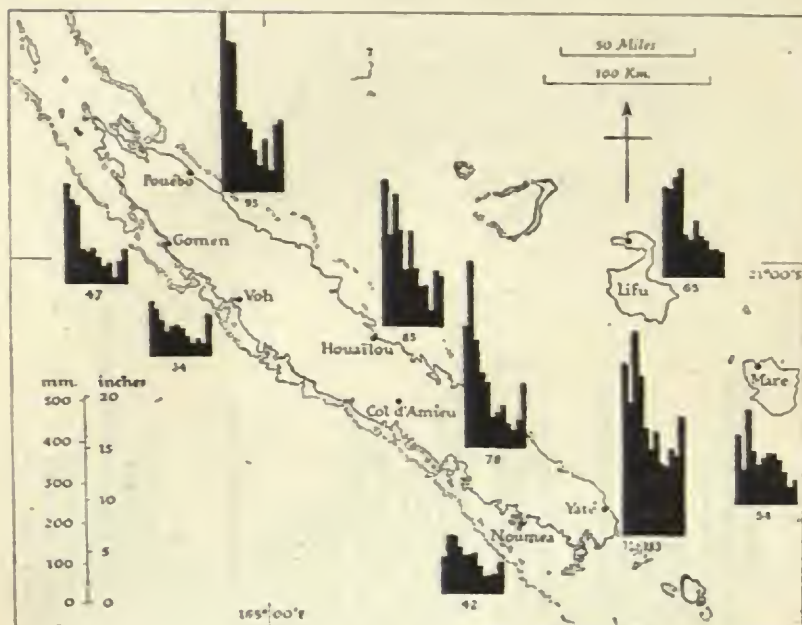


Fig. 138. Average monthly rainfall at selected stations in New Caledonia

Figures beneath the graph for each station represent the average annual rainfall in each case. The monthly and annual averages for Yaté cover a period of 19 years; for Voh, 23 years; for Noumea, 35 years. Those for other stations cover periods of only 4 or 5 years. Based on: (1) P. Surraud and H. Schmidt, 'Climatologie de la Nouvelle-Calédonie', *Proceedings of the Sixth Pacific Science Congress*, vol. III, p. 736 (Berkeley and Los Angeles, 1940); (2) G. Schott in *Handbuch der Klimatologie*, Bd. IV, Teil T, p. 98 (Berlin, 1938).

VEGETATION

The vegetation of New Caledonia is remarkable from several points of view; indeed, with the possible exception of Hawaii, no island in the Pacific is of greater interest to the botanist. The flora is rich—some 2,311 species of flowering plants and conifers have been recorded and more doubtless remain to be discovered—and a large proportion of the species and genera are known from nowhere else in the world.

These peculiar or endemic species form about 77 per cent. of all

the native plants, a higher percentage than in either New Zealand or Hawaii and equalled only in Madagascar among the large islands of the world. This high degree of endemism in the flora no doubt depends on its history, about which we know very little, though clearly the island must have been isolated since a very remote geological period.

A second remarkable feature of the vegetation of New Caledonia is that unlike that of most of the larger Pacific islands it consists very largely of drought-resistant plants. This is partly explicable by the rather low average rainfall over most of the island and the frequent droughts, which are irregular in duration and incidence, but it is also due to the large area occupied by shallow stony soils with little power of retaining water. Though the conditions for plant growth are not unlike those in the semi-arid parts of Australia, New Caledonia has no native gums (*Eucalyptus*) and few wattles (*Acacia*).

A peculiarity of the island is the large number of conifers found in it; some 29 are known, a unique total for a tropical island. The chief genera are *Podocarpus* and *Araucaria* (to which the monkey puzzle belongs), but all the species and some of the genera are endemic. Except for the extraordinary pillar-like *Araucaria columnaris* (Plate 63), which is a coastal tree, these conifers are chiefly found on the mountains above 3,000 ft.

The vegetation is varied as well as rich in species; the variations depend on local differences in humidity and geological formation. The extensive serpentine outcrops have, as in other parts of the world, a distinct and highly characteristic vegetation. At the present day a large part of the vegetation is determined by human activities (especially burning) as much as by natural factors, though only a small fraction of the whole area is cultivated. Mineral prospectors often needlessly destroy the vegetation of whole mountain sides, and unless this ruthless destruction is checked before long much of the unique flora of the island may disappear; its place will be taken by useless and uninteresting weeds. For the future prosperity of agriculture in the island it is essential that the destruction of the forests should stop, because of the vital part they play in conserving and regulating the water supply.

On sandy shores the vegetation consists of plants such as *Vigna lutea* and *Canavalia obtusifolia*, together with grasses and masses of *Ipomoea pes-caprae*. Behind these plants there is generally a belt of shrubs about 3 ft. high. Common species here are *Scaevola frutescens* and *Suriana maritima*, with *Vitex trifoliata* in the south of the island

and *Desmodium umbellatum* in the north. Still farther from the sea a strip of beach forest is often found, consisting of such trees as *Casuarina equisetifolia*, *Celtis conferta*, *Thespesia* and species of *pandanus*, with lianas growing over them and shrubs beneath. *Araucaria columnaris* was at one time common on these sandy beaches, but has been ruthlessly exploited for its valuable timber.

Mangrove forests, not usually very tall, cover considerable areas of muddy shore in some parts of the island. In these the stilt-rooted *Rhizophora mucronata* forms extensive stands on the seaward side, giving place landwards to *Avicennia* and *Lumnitzera*, which are often mere bushes under a yard high. *Derris uliginosa* is also characteristic of the mangrove swamps, climbing seawards from the dry land where it is rooted. Beds of *Salicornia australis*, belonging to the same genus as the English glasswort, and salt marshes covered by grasses and sedges are often associated with the mangroves. In some places the mangrove swamp passes gradually into coastal freshwater swamp forest, formed of a mixture of tall evergreen trees, among which *Pisonia grandis*, *Celtis paniculata*, and the fig *Ficus prolixa* may be mentioned.

Inland, evergreen forest covers a large though diminishing area (Fig. 139). In some places, for instance between Dumbéa and the Yaté valley, there are large stretches of unbroken and almost untouched forest, but in most parts of the island there are many separate tracts rather than extensive masses of forest. The best and most luxuriant forests occur in the south and on the igneous rocks of the Ignambi chain. The distribution of forest is clearly related to the rainfall; in the rain shadow of the hills and other particularly dry areas, the forest disappears altogether or becomes restricted to the banks of streams and moist sheltered hollows. All this forest consists of a mixture of many species of evergreen trees, no one of which is dominant over a large area. Lianas and epiphytes are common, and in general it is like a tropical rain forest, though less tall and luxuriant. At its best the trees reach a height of 90-100 ft. Several different forest types can be distinguished, depending chiefly on altitude, geological formation and soil moisture. A characteristic type of forest fringes the river banks in some parts of the interior: here are found the giant figs *Ficus prolixa* and *F. aphanoneura*, with another very tall tree, *Eugenia Brackenridgei*, which sometimes becomes locally dominant. Where the colonists have destroyed the original river-marginal forest, pure stands of *Casuarina Cunninghamiana* often spring up; they regenerate quickly after fires and can

apparently maintain themselves indefinitely. Comparatively luxuriant forests are found on the sedimentary rocks: they are three-storeyed and the lowest storey of trees includes a tree fern and the palm *Cyphokentia*. In the forests on the serpentine in the south a species of kauri pine, *Agathis lanceolata*, was formerly found, towering above the main canopy of the forest, but it is now almost extinct.

As the mountains are climbed the composition of the forest changes, though the general appearance remains much the same. The lowland species give place to others, and conifers, especially species of *Araucaria*, soon become conspicuous. Epiphytes and ferns become more plentiful. On the highest ridges and summits the tall evergreen forest finally changes to a dwarf mist forest of gnarled and twisted trees thickly covered with a blanket of wet moss. Many plants of great beauty and interest grow here, among them a curious tussock-forming lily with red flowers (*Xeronema Moorei*) and the silvery-leaved *Astelia neo-caledonica*.

In the drier areas on sedimentary and schist rocks, and on the igneous rocks of the Ignambi mountains, but not on the serpentine, there are many square miles covered with the *niaouli* tree, *Melaleuca leucadendron*, remarkable for its silvery white foliage and thick, corky bark. (Some authorities regard it as a distinct species from the Australian and Malayan *M. leucadendron*, calling it *M. viridiflora*.) This

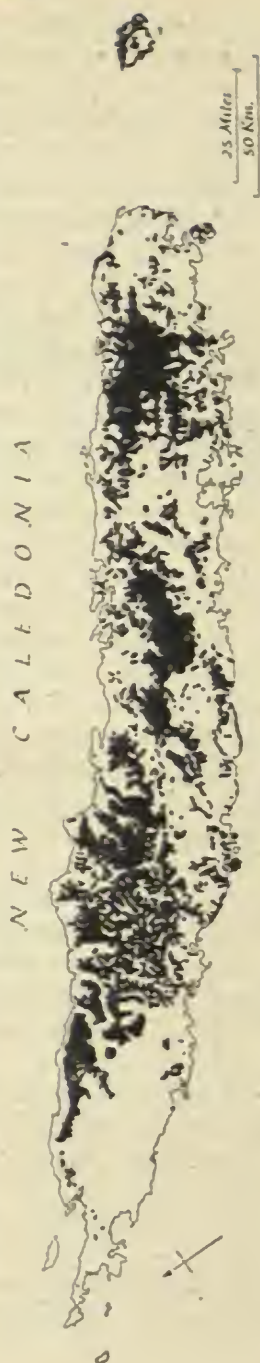


Fig. 139. New Caledonia: forest areas

The forest is of varying density; some of the areas shown have a very thin tree cover. Based on same source as Fig. 119.

niaouli vegetation might be called either open woodland or tree-covered savannah, as below the trees there is little shade and the ground is covered with grasses and other plants. The *niaouli* country is frequently burnt and most of the trees show signs of having survived many fires. In the Ignambi chain there is a distinct variety of the *niaouli* which is only a knee-high shrub. Though this vegetation is very drought-resistant, in the northernmost part of the island it becomes restricted to the valleys, the ridges being almost completely bare.

To a botanist the most interesting vegetation in New Caledonia is the scrub on the serpentine. Sometimes it is dense and sometimes more open; often it looks like the *maquis* of southern France or the chapparal of California. The shrubs composing it have small leathery evergreen leaves which are either hairy or shiny, sometimes looking like polished metal. The number of species is very large—in this respect this scrub is like that of Western Australia—and at first every bush seems to be different from the rest. In the Plaine des Lacs the interesting insectivorous pitcher plant *Nepenthes neo-caledonica* scrambles over the bushes, and another insectivorous plant, the sundew *Drosera neo-caledonica*, grows in some parts of the scrub on bare ground liable to flooding.

Besides the forest and scrub there are also grasslands. About Noumea there are fresh green meadows, probably artificially produced, of the grass *Andropogon halepensis*. Elsewhere there are dry grasslands of *Andropogon* and *Aristida* species, with herbaceous plants mixed with the grasses. These grasslands are important as grazing land.

In the Isle of Pines and other neighbouring islands the vegetation is much less varied than on the mainland of New Caledonia. The Isle of Pines (which owes its name to the former abundance of *Araucaria columnaris*) has a small stretch of forest in addition to coastal vegetation. On Mare there is a coastal zone of coconuts and *Araucaria columnaris*; the interior is largely low open forest rich in epiphytic ferns and orchids, mixed with scrub. Lifu has a similar vegetation, but the forest is denser and taller. Uvea was formerly forested, but the original forest has been destroyed by fires.

FAUNA

The native land fauna of New Caledonia is of a very specialized type. One of its most striking features is the almost entire absence of

mammals—the rat, the pig and several kinds of bats being the only pre-European forms. Birds, of which there are about 100 species, are fairly numerous, but are not often seen, since they tend to live mainly in the forest and in the mountain regions. They include types of duck, cuckoo, flycatcher, rail, parakeet and pigeon, as well as shore birds and birds of prey. One of the most remarkable birds is that known by its native name, *kagou* (so called from its cry); it has ash grey and reddish brown plumage and red legs, and is about the size of a domestic fowl. Though its wings are well developed it uses them merely as an aid in running and does not fly. It can be tamed, but since it can be captured easily by dogs it has now become rare.

The fauna includes several kinds of lizards, but no frogs, and there are no venomous land reptiles, though there are scorpions and centipedes. Insects are very numerous. There are few butterflies, though those which occur are often beautifully marked. Crickets are almost a plague in some years, and mosquitoes are always common, especially in the season from about December to April.

The marine fauna is very rich and varied. It includes dugong, turtles, and some kinds of sea snake, the bite of which is very venomous. There are very many kinds of fish, crustacea and shell-fish; some kinds of fish are poisonous to eat.

The land fauna has been affected to a considerable extent by European occupation of the island. Cattle, sheep, dogs and horses have been introduced and are now common. Sumatran deer, also introduced at a fairly early date, have multiplied so greatly as to have become a pest through their attacks on growing crops. Their depredations were so serious that in 1931 the residents of a southern district organized a drive and killed many thousands of them by machine-gun fire. In 1935 it was reported that despite consistent shooting the animals were still numerous, but since the war their numbers have apparently been very much reduced.

HISTORY

Discovery and Annexation

New Caledonia was discovered in 1774 by Captain Cook, who landed at Balade on the north-east coast, and named the island from its similarity, as he saw it, to the mountains of Scotland. Prevented by the reef from sailing round to the west coast, he doubled back along the east coast and discovered the Isle of Pines. In 1792 a

French expedition under D'Entrecasteaux, with Huon de Kermadec as captain of one of the vessels, visited New Caledonia in the search for La Pérouse, and thoroughly explored the east coast. Kermadec died there, and his name is perpetuated in the Huon group to the north. In the succeeding half-century visits were paid to the island by naval expeditions and by traders in sandalwood and *bêche-de-mer*.

In 1843 the first serious attempt at religious proselytization was made by French Roman Catholic missionaries of the Society of Marists. Pope Gregory XVI had in that year created New Caledonia a vicariate apostolic, and charged Bishop Douarre (who had been consecrated for the purpose) with the task of evangelization. Accompanied by four other members of the society he landed at Balade from the *Bucéphale*, commanded by Captain La Ferrière. A mission station was established there, and La Ferrière made investigations along the Diahot river and on the north-east coast, discovering the harbour of Hienghène. His report and that of Ensign Pigeard, published in 1845, were both favourable to the island as a place for colonization.

The French flag had been hoisted near Balade, but on the representations of Britain the corvette *Seine* was despatched from France to remove it. The *Seine* was wrecked on a reef through mistaking the Puébo passage for that at Balade. Her captain, Leconte, who surveyed and explored the country in the neighbourhood, declared himself against any plan of establishing a colony: the sandalwood would soon be exhausted; the competition of Australia and New Zealand would prevent the development of pastoralism, and other resources were negligible; England would not dream of annexing the country, and it should stay in the hands of the missionaries. Despite the urging of Douarre, who returned to France and pleaded for it, French occupation of the island did not then take place. Trouble with the natives occurred a little later; a mission brother was killed and the station at Balade was pillaged and burned. The missionaries took refuge at Puébo, whence they were rescued in 1847 and taken to Sydney. They were re-established in 1848 on the Isle of Pines, and met with success, but a second attempt to place a station on the mainland in 1850 failed. In the same year the French vessel *Alcmène*, commanded by D'Harcourt, visited New Caledonia to explore the east coast of the island. The pass through the reefs at the north end of the island near Balabio (missed by Cook) was discovered, though the discoverer and a dozen men were killed

and eaten by the natives in the vicinity. One of the ship's company, Bérard, deputed to examine the resources of the country from the point of view of colonization, reported that it was an excellent field, with mineral and other wealth, and with the Isle of Pines as a possible penal settlement.

In 1851 the Marist missionaries again established themselves on the mainland, at Balade and Puébo, led by Douarre, who, however, died in 1853.

French political interest in New Caledonia, which had grown slowly, was now aroused by the new prospects presented. In 1853, stimulated particularly by the development of Australia and by the desire to have an alternative convict settlement to Guiana, France took possession of the island. This act of annexation, carried out by Rear-Admiral Febvrier-Despointes, aroused some resentment in Australia, given point by the fact that a British surveying vessel was at the Isle of Pines at the time.

Colonization

Till 1860 New Caledonia was embodied in the French Establishments in Oceania under the governor at Tahiti. It became an independent colony in 1860, but remained under military administration till 1884.

In 1854 the town of Noumea was founded as the capital, and received at first the name of Port-de-France. Colonization was then beginning, especially in the south-west. In 1855 the Marist mission extended its work by forming a new centre at Conception, about 6 miles south of the capital, and began the growing of coffee there; shortly afterwards another station was set up at Saint-Louis (Plate 68). The property acquired by the mission was then officially recognized. About the same time there was a general proclamation that all the lands of the colony belonged to the government, which reserved to itself the rights of purchase from natives and of disposal of all unoccupied lands, by sale, gift or other means.

The early colonists came partly from among the military detachments—men who retired to settle there; partly from Australia, attracted by the prospects of agriculture or of finding gold; and partly from among a body of traders led mainly by Paddon. Paddon was an Englishman who established a station at Ile du Bouzet (later known as Ile Nou), opposite Noumea, about 1845 for the export of sandalwood, pearl shell, coconut oil, 'whalebone' and *bêche-de-mer*, and for trade with the local natives. He received large land concessions from

the government after the establishment of the colony, and on his side sold to them in 1857 Île Nou (which he had acquired from the natives at an early date). Paddon himself died in 1861, but he had paved the way for many of his employees and companions to become settlers. Also among the early colonists was John Higginson, an Englishman who later became naturalized, and who for long took a leading part in commercial and financial affairs. A certain number of creoles from Réunion also came to cultivate sugar cane.

By 1862 there were 420 people of European origin in the civil population. But immigration of these free colonists was fairly slow, and ten years later the total was still less than 2,000 (not so great as that of officials and military forces).

Convict Settlement

In 1864 the first batch of convicts arrived, and from then until 1894, when transportation began to be reduced, the majority of the European population was composed of them. Large public works were carried out by convict labour, and many of the men were hired out as employees to the free colonists at the nominal fee of 12 francs per month. In time, many of the convicts were released and given grants of land. (At the present time a considerable part of the white population still consists of their descendants.)

There seems to be general agreement that the progress of the colony was retarded by the transportation system. It was wasteful in several ways. The hiring out of convicts as labourers brought prosperity to individual capitalists and immediate revenue to the administration, but the welfare of the colony would probably have been better served by concentrating their labour on public works, especially means of communication, in which New Caledonia was for long deficient. The labour of this type was of a low standard of efficiency, and even when freed many of the convicts lacked incentive to regard the colony as their home and to develop its resources to the full. One of the first to recognize this was Governor Feillet, administrator from 1894 to 1902, who pursued an enlightened policy of discharging convict shipments in favour of a system of free colonization.

Other Developments

Meanwhile the social and economic development of the colony had been proceeding. In 1856 a survey department (*Service cadastral*) was started, under the control of military engineers; it was reorganized in 1867 under the title of *Service topographique*. In 1859 a postal

service from Noumea to Canala (then called Napoléonville) was begun, with native couriers; it was extended in 1864 to Puébo, and in 1870 to Bourail. Primary schools were opened at Noumea, Paita, Canala, and in the Isle of Pines and the Loyalty islands. In 1866 Port-de-France, which had been created a commune in 1859, was renamed Noumea (Nouméa), to avoid confusion with Fort-de-France in Martinique. The town was growing rapidly, and various amenities were provided, including a hygienic and ample water supply in 1871. A variety of regulations were introduced by successive governors, providing for administration, justice, land settlement, treatment of convicts, etc.

The progress of settlement was steady but not rapid. The first colonists (apart from the missionaries) had established themselves mainly around Paita and Dumbéa. Later, by grants of land to free colonists and to freed convicts, settlement spread to St Vincent—where coffee was grown in 1862; to Canala and Nakéty—where rice was grown in 1864; to Yaté—where a convict establishment was first tried, unsuccessfully, in 1864; and to Bourail—which was established as an agricultural centre in 1867, and which remained as one of the most flourishing areas. Later again the Diahot region, Moindou and the Uarai-Fonwary region were developed, in part with the aid of the convict system. The mining industry began, and took an increasing share in the economic life of the colony.

One result of the cessation of transportation, however, was a commercial depression, and in the early years of the present century the economic condition of the colony was at a low ebb. After about 1910 there was a revival, due largely to the further development of mineral resources. With this increasing development, especially since the abandonment of transportation, the shortage of labour became keen. Since this could not be met by calling upon the natives, who by habit and temperament were unwilling to fill the role of consistent wage-labourers, resort was had to the introduction of indentured labour from abroad—in part from other Pacific islands, but largely from Java and Indo-China.

Relations with the Natives

When possession was taken of New Caledonia many of the chiefs of the most important tribes were induced to recognize officially the sovereignty of France and to take the oath of fidelity. In 1867 the structure of the native tribe was officially recognized by Governor Guillaïn, and laid down as a legal organization, with property rights

of a communal kind and civil obligations in respect of offences committed on its territory. The principle of native taxation was also laid down.

The history of the colony has been marked by considerable friction between the native people and the Europeans. Deprivation of much of their land without compensation, compulsion to work for the government (often without even food as payment), the poll-tax, and the common disregard of their customs and religious beliefs led a number of native communities to feel resentment. Killing of Europeans and intermittent insurrection took place and were followed by savage reprisals; in these not only the military authorities took part, but also natives armed by them and taking the opportunity to pursue old tribal feuds. The most serious outbreak, in which 200 Europeans were murdered, took place in 1878-9, but there was also a rising as late as 1917.

The last quarter of a century, however, has seen the growth of amicable relations, and a closer integration of the native people with the general life of the colony. Many of them are good agriculturalists, provision has been made whereby they may become French citizens, and a number of the younger men have served France with distinction in the present war.

GROWTH AND COMPOSITION OF POPULATION

There has been no radical change in the gross population of New Caledonia and its dependencies during the last thirty years. In 1906 the total population (including that of the Bélep islands, the Isle of Pines and the Loyalty islands) was 53,346; according to the latest census, taken in 1936, it was 53,245. The composition of the population at this latter date was as follows: 17,384 persons classed as white (including 1,430 Japanese); 28,800 natives; and 7,061 coloured immigrants.

Europeans

Of the (European) white element in the population the majority are of French extraction; in 1936 they numbered 15,143, of whom about one-sixth were born in France and the rest born in the colony. They comprised 5,422 men, 4,706 women and 5,015 children. There were about 1,000 seamen, convicts, and officers and men of the military forces; the remainder were officials, settlers, miners and men engaged in commerce, with their families. The whites have

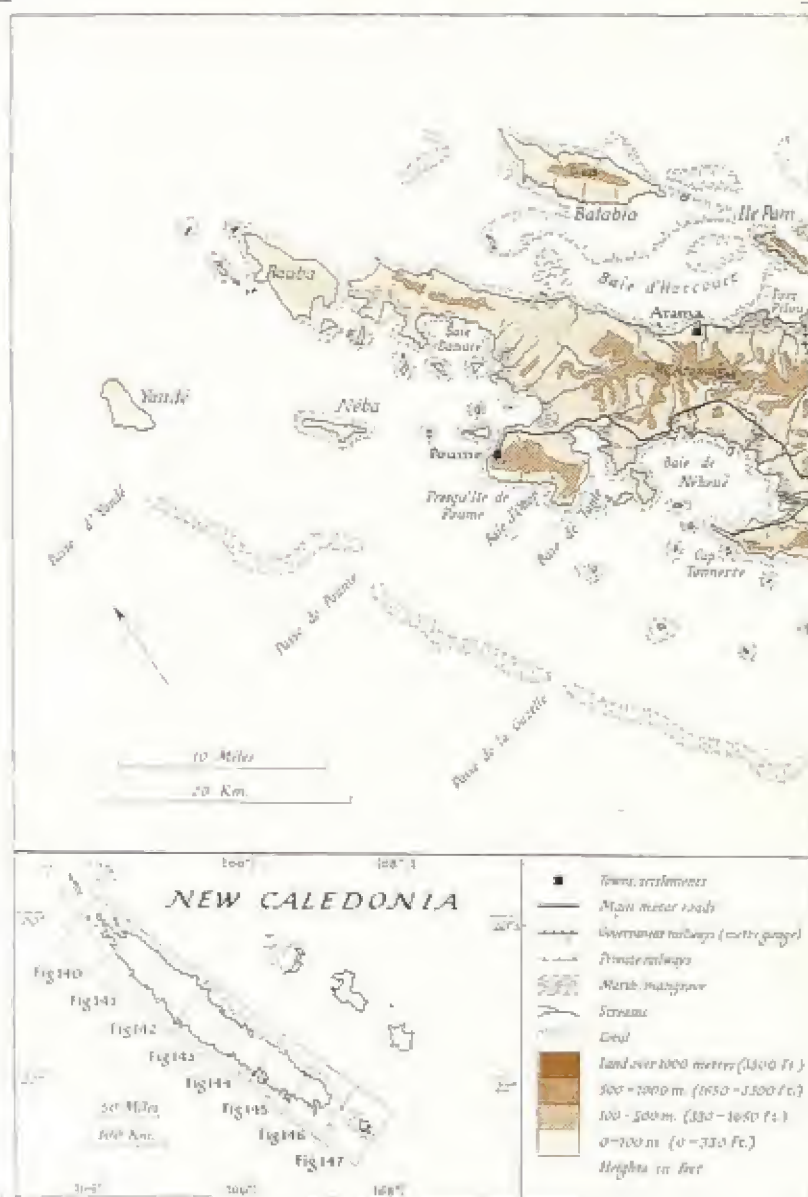


Fig. 140. New Caledonia: north-western part (with general key)

Based on official sources.

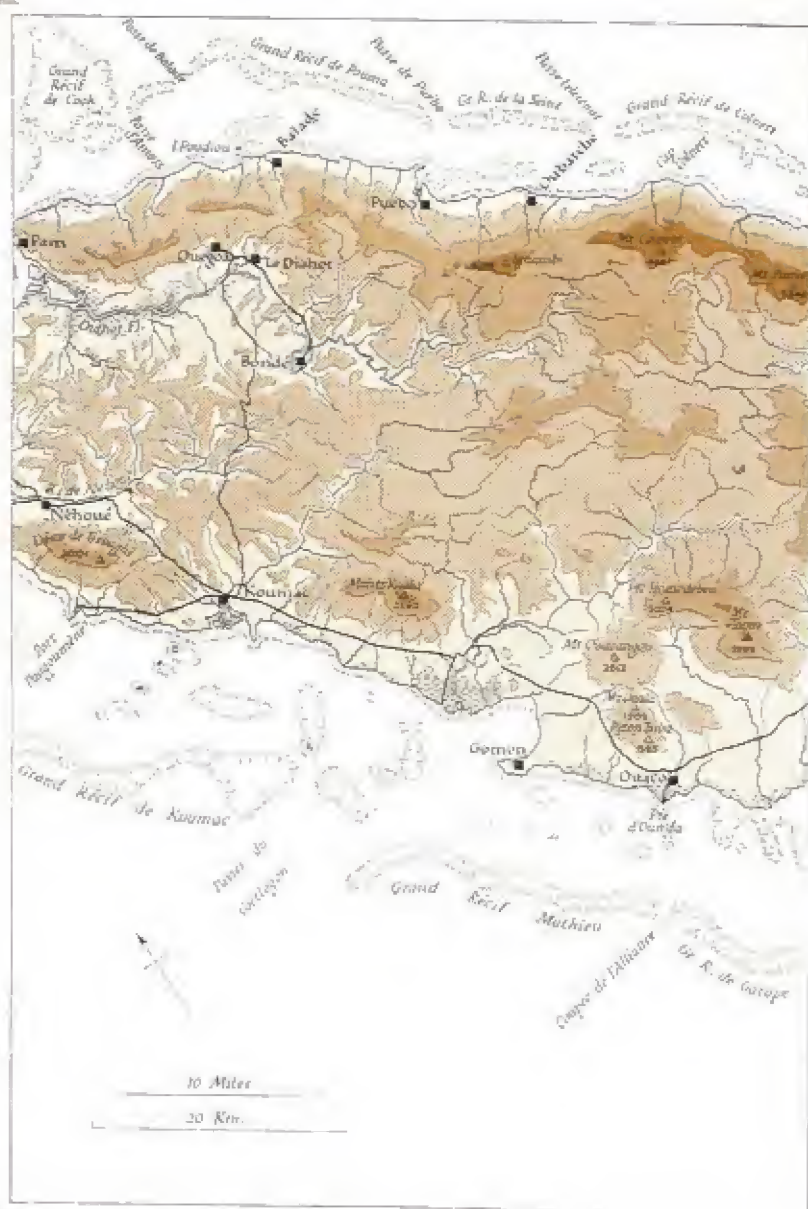


Fig. 141. New Caledonia: Parn-Ousse
Based on official sources.

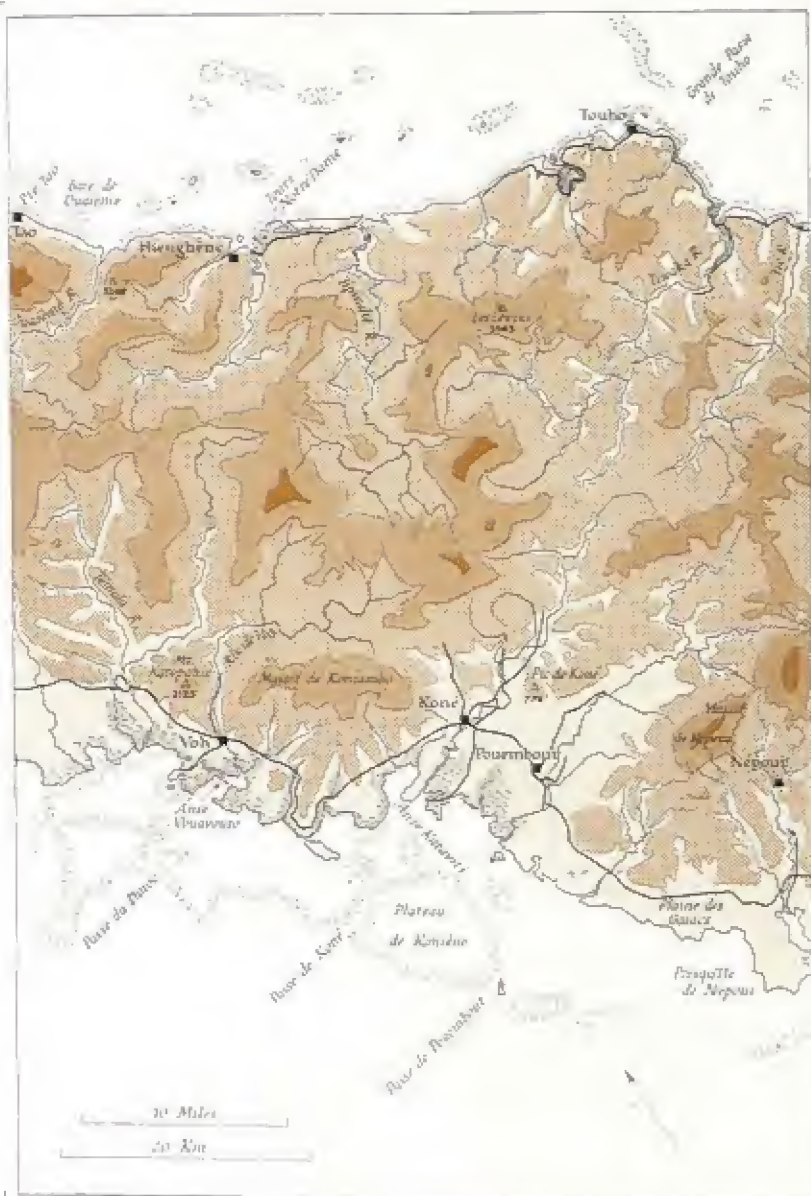


Fig. 142. New Caledonia: Hienghène-Népoui
Based on official sources.

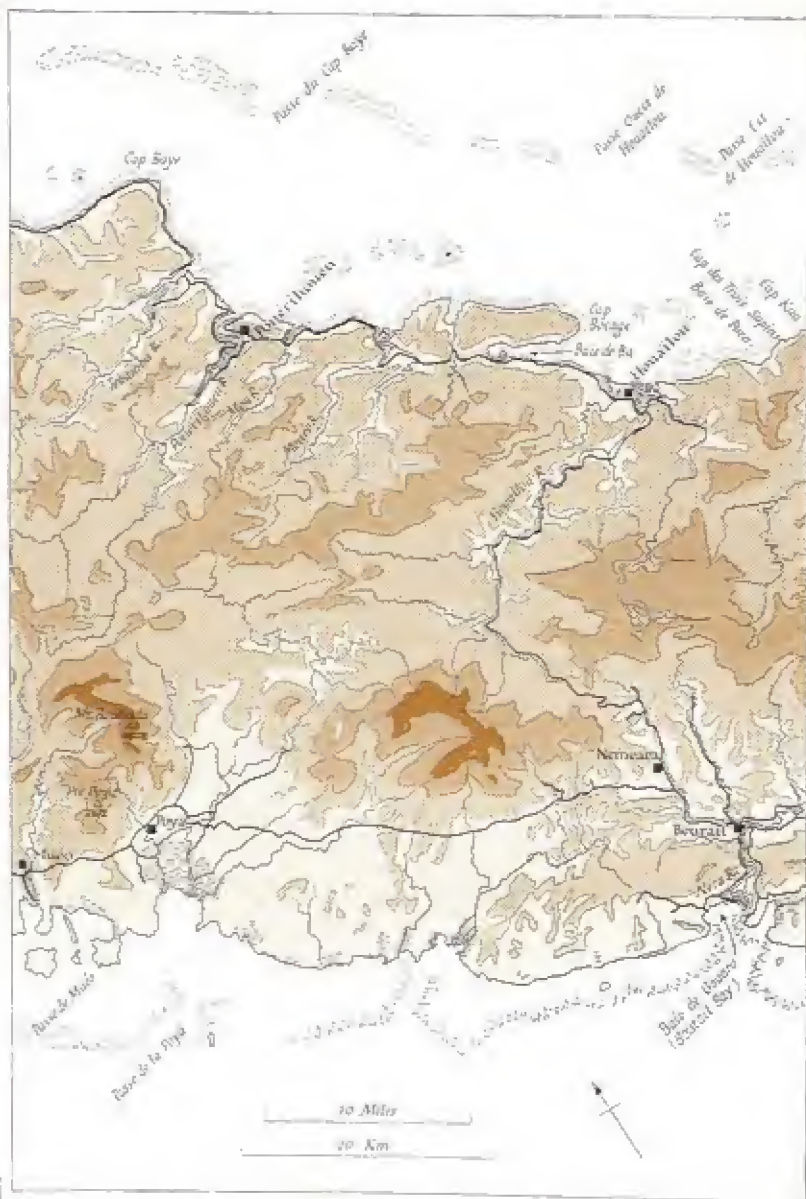


Fig. 143. New Caledonia: Ponérihouen-Bourail
Based on official sources.



Fig. 144. New Caledonia: Kouaoua-Bouloupari
Based on official sources.



Fig. 145. New Caledonia: Comboi-Noumea
Based on official sources.

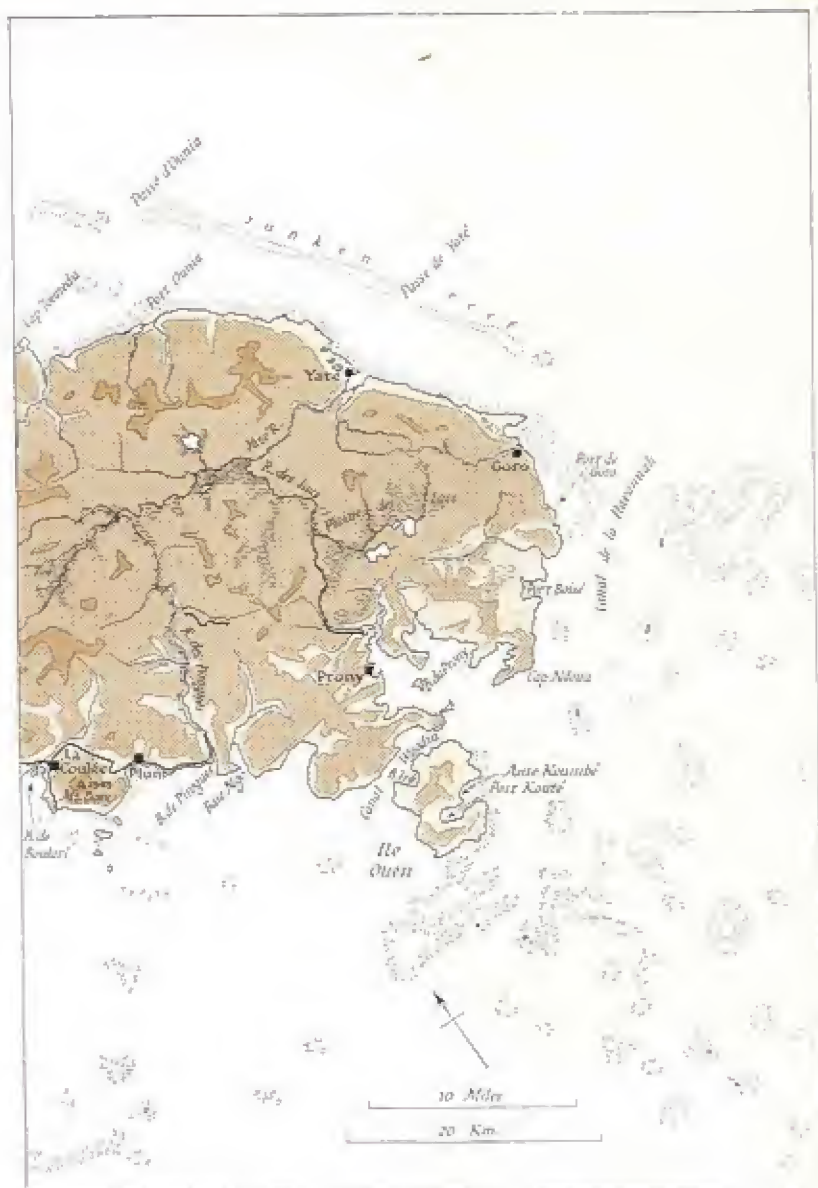


Fig. 146. New Caledonia: south-eastern part
Based on official sources.

decreased considerably from the maximum figure of over 23,000 in 1901. This decrease is due primarily to the cessation of transportation; the convicts, who were at their maximum of 10,935 in 1887, diminished from about 10,000 in 1901 to only 329 in 1936. At the same time, the stable element of French settlers, etc., was slowly increasing.

Japanese

At one time the Japanese were increasingly prominent in the colony. Their immigration began in 1892, when the Société Le Nickel imported them to help replace the decreasing convict labour, and continued at intervals during the next ten years. On the conclusion of their contracts most of these Japanese established themselves in the country, and built up a social position considerably higher than that reached by other Asiatics. By 1918 there were 2,458 of them in the colony, mostly in the interior. But by 1921 their numbers had begun to fall, and in 1933, after the depression had come, they were reduced to only 1,110. Their numbers fell particularly in the mining districts; in Thio for instance, where there were 394 Japanese in 1921, by 1933 there were only 86. By 1936, however, the total number of Japanese had increased in the country again slightly, some at least of this increase being due to births within the colony. But the number of Japanese women was small, owing to difficulties raised by the French authorities, and most of the Japanese men were married to or associated with Javanese, Annamite, European or native women. In a census (taken about 1934) of over 300 children of Japanese fathers, about 46 per cent. had Javanese, Annamite or native mothers, 38 per cent. had European mothers, and only 16 per cent. had Japanese mothers.

For a number of years the Japanese have turned from mining to other occupations. An enumeration of them by occupation about 1934 gave the following distribution:

Workmen or day labourers in mines, sawmills, etc.	about 31 per cent.
Cultivators or small farmers	23 "
Artisans and traders	20 "
Fishermen	4 "
Employees (unspecified)	2 "

As cultivators the Japanese then owned about 11,200 acres of land, bought from European settlers, and had leased another 5,000 acres. The amount of land they had thus acquired had grown since 1921, and among their activities they supplied Noumea with vegetables. Before the present war there were well over 100 Japanese trading and

shop-keeping establishments in the colony. In Noumea, where there was a Japanese club, nearly half the general stores were Japanese, and they handled most of the growing volume of merchandise imported from Japan.

Immigrant Labour

The scarcity of labour in the colony led to the importation of coloured labourers from abroad. The first source to be tapped was the New Hebrides, from which in 1891 there were nearly 2,000 men at work in the colony. Other sources tried were China in 1884 and Japan in 1893, but neither gave the results expected, nor did an attempt in 1895 to import Annamite and Tonkinese convicts. The introduction first of indentured Javanese and then of Tonkinese, however, has been more successful. In 1911 there were less than 2,500 coloured immigrants in all, about one-half being Javanese and the rest New Hebrideans, Tonkinese, Chinese, Arabs and Solomon islanders. But by 1929 there were over 7,000 Javanese and nearly as many Indo-Chinese. The next few years saw a diminution in their numbers to less than half owing to repatriation during the economic depression, but as the commercial prospects of the colony began to revive again the numbers grew once more. The latest figures, for the beginning of 1939, gave 7,735 Javanese and 2,261 Indo-Chinese indentured labourers, and in addition about 1,000 free residents from the same source. The indentured labourers are under contract for five years; the Javanese are mostly agricultural and domestic workers, while the majority of the Indo-Chinese work in the mines.

Native Population

Changes in the native population are difficult to measure accurately, owing to the unreliability of the early census counts and to the frequent aggregation of the figures from New Caledonia proper with those from the Loyalty islands, where the population movement has not been entirely parallel. An early estimate for the native population, about 1870, put the figure at about 40,000, and while another estimate put the number at probably double this, the actual native population can hardly have been less. By the census of 1936 there were only 17,091 natives on the mainland (5,845 men, 5,052 women and 6,194 children) and 11,097 in the Loyalty islands. In general it can be said that there was a serious decline in the native population in the latter half of the nineteenth century, after European colonization began; disease, alcohol and disturbance of the native

economic life were the principal factors. This decline persisted, though at a slower rate, till 1921 in New Caledonia itself and till 1926 in the Loyalty islands, since when there has been a tendency to a gradual increase (see Table below). This increase can probably be attributed to the cumulative effect of the medical and social measures taken by the administration. A drop in the population in 1938 was due to epidemic disease, principally influenza. The major part of the native population on the mainland is now to be found on the east coast, in the vicinity of Koné, Houailou, Canala, Poindimié, Ponérihouen, Hienghène, Touho and Thio. The people live mostly on tribal reservations set aside for them by the administration, and only about 1,500 live outside the tribal organization.

*Changes in the Native Population of New Caledonia and
Adjacent Islands, 1885-1938*

Year	New Caledonia	Isle of Pines	Loyalty Islands	Total Natives	Total Population
1885	25,975	—	11,959	37,934	60,237
1891	23,090	—	—	—	—
1901	17,128	—	10,640	27,768	54,718
1906	17,015	—	11,579	28,594	53,346
1911	17,057	605	11,173	28,835	50,608
1921	15,621	573	10,906	27,100	47,505
1926	16,585	518	9,812	26,915	51,153
1931	16,821	651	11,030	28,502	57,165
1936	17,091	612	11,097	28,800	53,245
1937	—	—	—	29,055	—
1938	—	—	—	28,856	—

Based mainly on *L'Océanie Française*, various years. A full analysis of the figures for 1936 is given in this publication, 1938, pp. 4-5. Cf. also M. Leenhardt, *Notes d'Ethnologie Neo-Calédonienne*, p. vii (Paris, 1930); *Annuaire Coloniale*, 45th year (Paris, 1931-2); *Pacific Islands Year Book*, p. 370 (Sydney, 1942); Fritz Sarasin, *Ethnologie der Neu-Caledonier und Loyalty-Insulaner*, pp. 22-3 (München, 1929). Discrepancies occur in some of the figures given in the various publications. The low figure for Loyalty islanders in 1926 is possibly due to the absence of a larger number than usual in New Caledonia and their inclusion in the mainland native population, which shows an unexpectedly large increase.

THE NATIVE PEOPLE

A name commonly used for the native people of New Caledonia in earlier years was *kanaka* (*canaque*). This is inaccurate, being simply a Hawaiian form of the general Polynesian word for 'man'; it has no racial or cultural significance when applied to the New Caledonian natives, and is disliked by them.

PHYSICAL TYPE

The people belong to the physical type ordinarily termed Melanesian; they are most closely related to those of the New Hebrides, though showing certain more primitive characteristics. They are of short stature, but well built, with a sallow dark brown skin colour. The hair is very dark brown or black, and frizzly, and most of the men are well bearded. The form of the head is dolichocephalic—that is, comparatively long and narrow—with the bony structure above the eyes well developed. The nose is thick and flat, with sunken bridge, and the lips are thick also.

LANGUAGE

The language of the people is of the Melanesian type, but, probably through long isolation of the different groups and lack of effective communication among them except in war, a range of diverse dialects has developed. Of these dialects there were at least sixteen major groups at the time of the coming of the Europeans, some with mutually unintelligible vocabularies.

Owing to warfare and to inter-marriage between people of different tribes, and also to the compression of the people into reserves, there has been a tendency for dialects to be modified, and for only the most important to survive. This process has been accentuated by the influence of civilization, which has also resulted in a general decay of the language. To meet the needs of communication among groups with different dialects, and between the natives and Europeans, a local *lingua franca*, compounded of French, pidgin English and native words, sprang up; this in turn has nowadays tended to be replaced by French alone. On the reservations, however, the native language is still spoken, and it is used to some extent for writing, especially in regions where the missions have adopted a dialect for the spread of their religious literature.

CULTURE

At the time of the arrival of Europeans in New Caledonia the culture of the native people was of a neolithic type, in which tools of polished stone were used. The traditions of the people give no evidence of the origin of the culture, which clearly had developed in the country over a long period of time. In contrast to the high differentiation of the various dialects, the culture was of a unitary character, from the Bép islands in the north to the Isle of Pines in



Plate 66. Country near Bourail, New Caledonia

The view is taken looking east, near the road to Houailou. Several native houses can be seen, including a round house of the old style (on the right, in the middle distance).



Plate 67. Ouaco, New Caledonia

A general view, in 1935, of the meat-canning works. The open pasture land is characteristic of much of this part of the country.



Plate 68. St Louis mission, New Caledonia

This station was set up about the middle of the nineteenth century, and became a centre for agriculture as well as for religious instruction.



Plate 69. Native village, New Caledonia

This village, near the west coast, shows native houses of modern style.

the south. Unlike many of the other large islands of the Western Pacific there was no clear-cut distinction between the mode of life and customs of a 'saltwater' people on the coast and a 'bush' people inland. And contrary to views sometimes held, there is no definite evidence that the culture of the people was directly indebted to elements from Polynesia, though there was some superficial contact on the east coast with the people of the Loyalty islands, which had received Polynesian influences.

Social Organization

In former times the native social organization was of local tribes, varying in size from a hundred or so to a thousand or more members, and occupying small villages scattered over their territory. Sometimes several of these tribes were united into a confederation, primarily for purposes of war, but they were essentially autonomous units, often speaking specialized dialects. Each tribe was divided into a number of clans, and each clan into a number of related family groups, which traced descent in the male line from a real or mythical ancestor. The clans were exogamous—that is, marriage could take place only with a member of another clan. Adoption was and still is a common custom, of children of kinsfolk and (formerly) of prisoners taken in war; the adopted person then assumed the marriage rule of his adoptive parents and was entitled to inherit land and other goods as a member of the group into which he or she had been received. The ties of kinship played a very important part in the native social life, linking the members of different clans within the tribe. As elsewhere in Melanesia, the maternal uncle was of great importance in helping and protecting his sisters' children, and a common form of marriage was for a man to marry a daughter of such an uncle. Exchange of sisters for marriage was frequent between men, and the children of such marriages then often intermarried again, also by exchange of sisters. The result was that two clans once united by marriage tended to remain so through each succeeding generation.

Authority was exercised in the native society by chiefs, who succeeded to their position by virtue of primogeniture. Each family and clan had as its head the senior member of the eldest branch, who was treated with respect, acted as the guardian of the treasures of the group, and had considerable influence in all public affairs. His position, however, was not autocratic, and though a portion of the fruits of the harvest was given to him, this was a mark of honour rather

than as tribute and he was expected to disburse these goods again among his people. Among his functions he had to know the traditions and ancient usages of his group, and to be a competent orator at public meetings, though in cases where he was not distinguished as a speaker he might get a brother to deputize for him. At the head of each tribe was a leader—known as the *grand chef* by the French—who was likewise the representative of its eldest branch and who guided tribal affairs as a whole. Though his authority was considerable it was by no means absolute; like the chiefs of the smaller units he had no rights of overlordship to the lands of his group as a whole, but simply a prominent interest in those of his own family and clan. But chiefs tended to be rather more wealthy than the rest of their people, and associated with their superior economic position was their possession of more than one wife. Whereas the ordinary people were monogamous, a clan chief might have three or four wives, and a tribal chief half a dozen or more. Of these women one was the head wife, and her children had superior rights in succession and inheritance. Though a tribal chief had a leading voice in decisions of public interest, his views tended to be guided by those of the old men of the community, who acted as a kind of tribal council.

In land tenure each tribe had its own territory, demarcated from that of others by boundaries of mountain ridges, streams or forests. Within this the land was held first as clan property and then as family property, the members of a family being the actual working unit in each case. Transmission of land was primarily by inheritance in the male line, though gifts of parcels of land occasionally took place. Sale of land was unknown before the coming of the European.

Occupations

The economic life of the people was based primarily upon agriculture and fishing. There was some collecting of forest products, and a little hunting, but the latter pursuit was very limited owing to the absence of large animals.

The plants principally cultivated were the yam and the taro. The planting of the yam took place mainly in September and October, though the precise season varied according to the district and the kind of yam used. The simple wooden digging stick was used, and the work was carefully done, mounds being raised to allow free drainage from the plants, which cannot tolerate much water. In the cultivation of taro much ingenuity was shown. Fields on the hill-slopes were terraced and irrigated, canals of earth and stones being con-

structed to bring water from long distances, even as much as 5 or 6 miles. These terraces and irrigation channels were the admiration of the early visitors to New Caledonia, but unfortunately large areas containing them have now been abandoned, consequent upon the decrease of population and the concentration of the tribes into reserves.

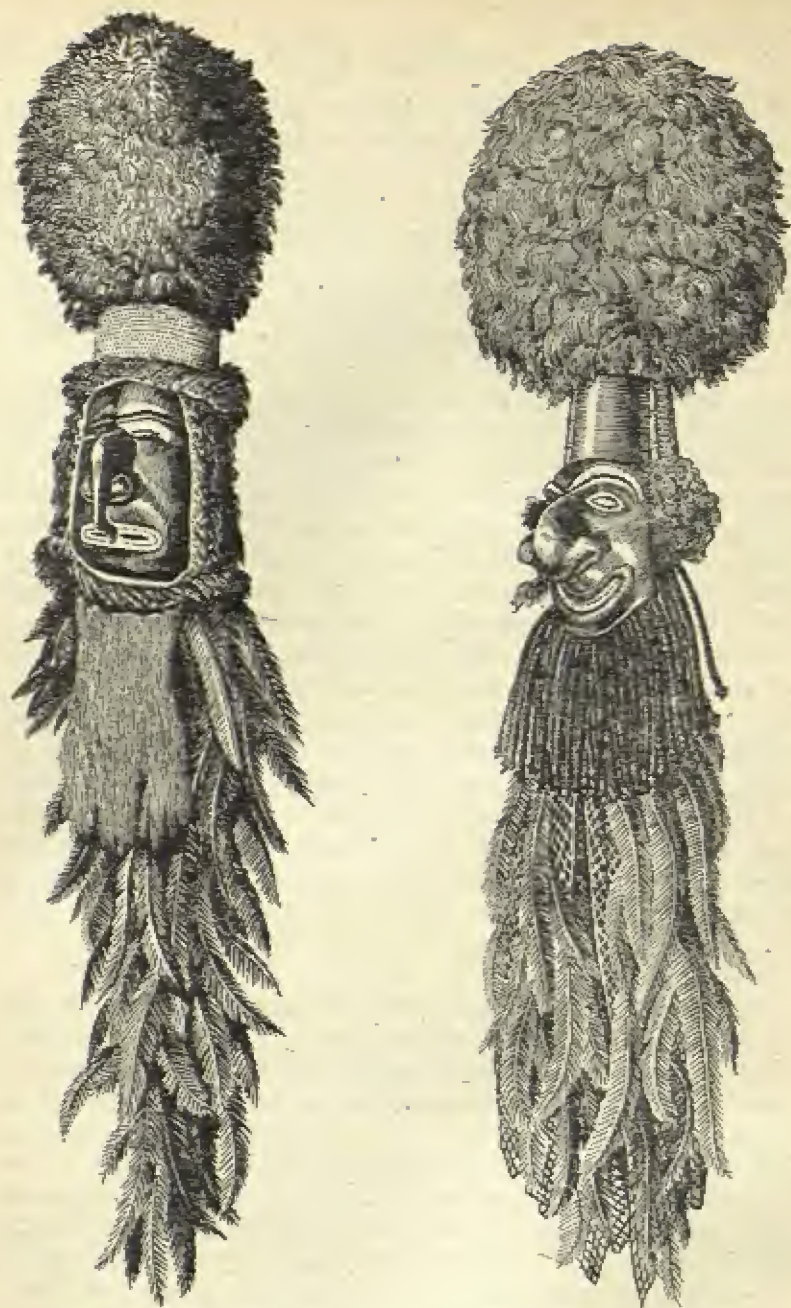
In fishing a variety of methods were in use, the appliances including seine nets 40 to 50 yd. long, small nets, hook and line, spear, and bow and arrow.

A remarkable practice which the New Caledonians shared with some other native peoples of the Western Pacific was that of eating earth. This was not a regular item of diet, but was consumed sometimes in large quantities, in time of food shortage or by pregnant women. The earth thus eaten was a kind of steatite, a magnesium silicate; it appears now to be exhausted, and the practice has died out. Cannibalism also was formerly frequent, human flesh being eaten partly for religious reasons, but partly for its own sake as food.

In fishing and in travelling along the coast and among the islands off the mainland canoes were used. One type, a double canoe consisting of two dug-outs joined by transverse booms, was very seaworthy, and could carry a crew of about 20 men. This type has disappeared. The other type, a single-outrigger canoe, which was more common, is still in use, and in a decked form, fitted with mast and sail, is capable of considerable voyages. The New Caledonians, however, are not seamen comparable to the Polynesians, and do not venture ordinarily beyond the Bélep islands and the Loyalty islands.

Ceremonial Life

Important in the former ceremonial life of the people were the *pilou-pilou*, ritual feasts, where the clans of the wives of the feasters were the guests. These feasts included huge presentations of yams and other food, often prepared for two or three seasons in advance, and at them exchange of ornaments and other property, dancing, and offerings of food and goods in propitiation of the spirits took place. Another notable feature in the social life was the employment of strings of shell discs (commonly termed 'money' by Europeans) for many kinds of exchange and sealing of contracts, as in marriage and adoption, purchase of valuable goods, and funeral gifts. Europeans soon perceived the advantage of having stocks of this 'shell money' for use in transactions with natives, and a rate of exchange with the franc sprang up. Traders' stores kept stocks of the



Figs. 148, 149. Ceremonial masks, New Caledonia

The mask on the left is from the Hienghène area. Each mask is about 6 ft. in total length, the face of the one on the left being 11 in. and that of the other 9½ in. long. The 'bushy' and beard are of hair, the face of wood, and the lower part of feathers and netting. Both masks have been drawn from specimens in the Museum of Archaeology and Ethnology, Cambridge.

shell strings, and some counterfeiting was even done by Europeans.

In former times warfare between tribes or confederations of tribes was common, and persisted well into the period of European administration. Abduction of women, murder, theft, or simple desire for human flesh were among the main causes. The weapons used were formerly lances, bows and arrows, slings and clubs of many forms, but in later years muskets also came into vogue. Warfare was



Fig. 150. Doorpost slabs, New Caledonia

The post on the left is 4 ft. 7 in. high; the others are 5 ft. 8 in. high. Drawn from photographs.

entered into with ceremony, and a formal declaration was the rule; peace was also concluded in a ceremonial manner and was usually accompanied by the gift or exchange of strings of shell discs as compensation for the losses suffered on each side.

Religion and Art

The precise nature of the former religious beliefs and practices of the people of New Caledonia is obscure, since no adequate study of them was made before their culture was largely broken up. In general,

however, their religion rested upon the recognition of two types of spirits: those of the dead ancestors, who were invoked as protectors of the living members of the group; and those, described by Europeans as 'gods' and 'demons', which had never inhabited a human body. The latter included such beings as the guardian of the realm of the dead, an earth-spirit, and the spirit of elephantiasis. To both the spirits of the dead and the spirits of non-human origin offerings were made.

New Caledonian art was applied mainly to objects of practical use. Though it had attained no very high degree of refinement, its treatment was often bold and aesthetically effective. In the construction of masks for ceremonial use (Figs. 148, 149) and in the sculpturing of wooden posts and doorways (Fig. 150), for instance, the people had developed a strongly marked style, in which a conventionalized human face played a large part as principal motif.

Modern Changes

Since the beginning of the century the demands of European colonization for land have resulted in the confinement of the natives to special reserves—often of no great size. The effects of this have been destructive to the old forms of organization, since in the same reserve have often been put members of different clans, speaking different dialects; sometimes they have been hereditary enemies. The clan system has thus tended to break down, and the old people no longer impart to the young the former knowledge and traditions of their people, regarding them as useless and indeed profaned by present conditions. The present-day people are largely Christian, and have imitated the ways of the European. Native crafts have been largely abandoned; cotton garments are worn; sawn timber and corrugated iron have tended to replace the former thatched and bark-walled houses (Plate 69); tinned goods are being used to the detriment of native foods; and cooking is done in kerosine tins instead of the native earthenware. The power of the chiefs, especially the 'great chiefs', has been increased, since they have been incorporated as minor officials into the French administration, under the European gendarmes. They have been clothed in French uniforms and their position made more autocratic; they are chosen and paid by the administration; they are responsible for reporting local affairs to the authorities; they collect the poll-tax of 15 francs per head for each adult male—receiving 10 per cent. of the same—and arrange for any work to be done by natives for colonists.

Another aspect of modern conditions is the extent of miscegenation. Formal marriages between Europeans and natives are rare, but extra-marital unions have been common, and still continue, and are mostly fruitful. The degree of race mixture is difficult to determine, since in many cases the native women take back their children to their own kinsfolk and bring them up in the native society, but by now it is undoubtedly considerable.

ADMINISTRATION

Before the war New Caledonia had no direct representation in the French parliament, but was represented on the Superior Colonial Council by a delegate, elected by the voters of the colony. In 1939 a proposed law to accord a deputy to New Caledonia and its dependencies was agreed to by the Chamber of Deputies and referred to the Senate.

General Administration

The administration of New Caledonia and its dependencies is in the hands of a Governor, assisted by a Privy Council (*Conseil Privé*) of 7 nominated members. There is also an elected General Council (*Conseil Général*) of 15 members; its functions are primarily the examination of the budget, but it occasionally initiates proposals on tariffs and other financial matters. For general administrative purposes the colony is divided into 5 districts: Noumea, Canala, Houailou, Touho, and Ouégoa.

Native affairs are controlled by a body known as the *Administration des Affaires Indigènes* in Noumea. Local supervision of the natives in the reserves and of those working for colonists is undertaken by the gendarmes in the principal centres of the districts, and immediately subordinate to them are the 'great chiefs' of the tribes. The natives enjoy only a relative freedom, having to obtain the permission of the gendarme before they may leave the neighbourhood of the reservation.

For local government Noumea, a municipality, has a mayor and council; the other principal centres are administered by municipal commissions or councils.

Law and Justice

In general the system of law in New Caledonia is that of France, but expressed or modified through Presidential decrees, promulgated

in the colony by order (*arrêté*) of the Governor. The head of the legal service is the *Procureur-Général*. The judicial organization comprises justices of the peace with extended jurisdiction, in Bourail and Thio and at Lifu in the Loyalty islands; a Court of First Instance and a Court of Appeal at Noumea; and a Commercial Court, also at Noumea.

For long the status of natives was undetermined by law, but decrees of 1932 and 1933 allowed them to obtain French citizenship on certain conditions after the age of 21 years. The chief conditions are ability to write and speak French, together with long service with the armed forces or the civil government, or qualifications as a school teacher of a high grade, or marriage with a Frenchwoman (provided there is a child of the union).

Finance

Revenue is provided mainly by import and export duties. The system of tariffs (p. 483), which is complicated (including both general and special duties), is in essence that applied by France since 1928 to her 'non-assimilated' colonies. It gives some degree of initiative to the local authorities but involves preferential treatment to France and the French colonial empire. Duties of 5-10 per cent. on chrome ore, based on the exports of the previous year, and of 3-5 per cent. on nickel *matte*, based on the analysis of the ore treated, are important in the revenue.

The budget in 1940 comprised a total of receipts and expenditure of 62 million francs. New Caledonia has been assisted at various times by a subvention from the metropolitan country, and a decree of 1931 authorized the colony to contract a loan of 95 million francs mainly for public works. By 1938 a total of about 58 million francs had thus been borrowed.

Currency is provided by a subsidiary of the Bank of Indo-China, which, subsequent to the failure of a local issuing bank in 1878, has had the privilege of issuing notes valid in the colony.

Land Policy

The land policy of the administration is designed to encourage European settlement, and from the first the government assumed control of the land. By various decrees all lands vacant and without owner became part of the domain of the state, and the consistent policy of concentrating the native population into reserves has further ensured large areas for European use. By regulation of 1916

free concessions of land may be obtained by French citizens on application to the Governor, from among lands regarded by the administration as open to settlement. These concessions vary between 25 and 62½ acres, according to location and quality. A provisional title is given, and replaced by a definitive title in 5 years. Further concessions are obtainable on easy terms of purchase, which may bring the total concession up to 500 acres.

Of a total area of roughly 4,000,000 acres it was estimated in 1939 that 1,400,000 acres had been alienated to colonists, 1,820,000 acres were lands suitable for mining, 110,000 acres were forest lands, and 320,000 acres had been reserved for the natives, leaving about 360,000 acres still available for settlement.

A recent decision of the government has allowed natives to acquire land by the same title as Europeans hold. This may possibly have the effect of reconstituting a native peasant population, since they display great interest in growing coffee and in other forms of agriculture, and also in rearing pigs and other small livestock (p. 473).

SOCIAL SERVICES

Health and Medical Services

The health of Europeans in New Caledonia is comparatively good. Though mosquitoes are plentiful there is no malaria, a condition attributed (doubtfully, from the scientific point of view) to the widespread occurrence of the *niaouli* shrub. Medical facilities include a public hospital and a military hospital at Noumea, with X-ray equipment and accommodation for 100 patients, and a few small hospitals elsewhere, maintained by mining concerns for their employees.

In the past the natives have suffered heavily from tuberculosis, yaws, and leprosy, but in recent years more energetic efforts have been made by the administration to combat these diseases. Leprosy, in particular, has been a growing menace. It was first recognized in New Caledonia in 1865 and in the Loyalty islands in 1883, and at one period there were estimated to be 4,000 lepers in the colony, including some Europeans. Leper settlements were set up and abandoned at various times, but a serious attempt at grappling with the spread of the disease began in 1911. In 1938 there were a sanatorium on Ducos peninsula, near Noumea, for European lepers and native lepers of the west coast, and two leper settlements on the east

coast, at Kananu near Houailou, and Maina near Hienghène. Settlements in the Loyalty islands were at Betséda and Boné on Mare, Chila on Lifu, and Oné on Uvea. There is also at Noumea a bacteriological laboratory in charge of two doctors of the colonial medical service.

Education

Education in New Caledonia is provided by the government and by the missions, and there are primary schools in Noumea and most other settlements of any size. The mission schools are aided by government or municipal funds. Apart from native children, but including Javanese and others, the total number of pupils in these primary schools is about 3,000; the majority of them attend the public schools. In 1937 there were 2,156 pupils at the public schools and 740 at the private schools, making a total of 2,896. This represents an increase of over 500 pupils in the previous ten years. In addition there are a large number of schools for native children, amounting in 1939 to 26 government schools, 35 Catholic schools and 24 Protestant schools. The total number of native pupils in these in 1939 was 4,298, an increase of 800 pupils since 1935. Secondary instruction, both classical and technical, is given in Noumea at the government La Pérouse College, where there are about 200 students.

(For Bibliographical Note see Chapter XII.)

Chapter XII

NEW CALEDONIA (*cont.*)

Economics: Ports and Settlements: Communications: Isle of Pines:
Loyalty Islands: Other Dependencies: Bibliographical Note

ECONOMICS

MINING (Fig. 151)

The mineral wealth of New Caledonia is great and varied, though some of the resources have been only partially developed owing to competition from other areas with lower production costs. The metamorphic rocks of the north yield a certain amount of copper, gold and argentiferous lead and zinc; the serpentine of the north-west and the south-east yields nickel, chrome, cobalt and iron, and the sedimentary earths give some manganese, antimony and coal.

History of Less Important Resources

Iron ore is probably the most abundant deposit, but much of it is low grade, and for want of local good coal it remained for long unexploited. Recently, however, owing to the growing demand of Japan, its extraction was undertaken by the Société Le Fer, with Japanese capital—the Nippon Kokan Kabushiki Kaisha and the Asano Seiren Kabushiki Kaisha being interested. The work, mooted in 1937 and begun in 1938, was retarded by the Sino-Japanese war, but production in three mines was well under way in 1939 at Goro in the south of the island (Plate 71). The programme of 350,000 tons per annum was not realized, but in 1938 a production of 36,729 tons was obtained, and in 1939, 103,414 tons, the iron content of the ore being 51-52 per cent. The export of ore in 1939 was 91,500 tons, all to Japan.

Cobalt, occurring in rich deposits on the summits of many of the serpentine hills, has been extensively mined in the past, but with the discovery of more lucrative deposits of argentiferous cobalt in the Belgian Congo and, especially, in Canada the industry of New Caledonia was practically killed some thirty years ago. Whereas in 1908 the value of cobalt ore exported was nearly 400,000 francs, by 1914 the total value of ore and *matte* exported was less than 125,000 francs, and for some years past the export has ceased entirely. Unlike

the mining of nickel and chrome, that of cobalt was done mainly by small-scale enterprise, in some cases even by escaped convicts.

Copper occurs principally in the Diahot valley in the north, and a small amount is occasionally exported (of a value of 10,000 francs in 1934), but its commercial importance is negligible. Gold has been found on the north, north-east and west coasts in various forms, and for a time in the early history of the colony attracted many pros-



Fig. 151. New Caledonia: principal mining centres

The names and symbols indicate the regions or general centres of the various types of mining, not necessarily individual mines. Some centres indicated as 'intermittent' may now be in production. Based mainly on: (1) *L'Océanie Française*, various years (Paris); (2) a French official report on New Caledonia for 1939 (unpublished, Noumea).

pectors. Promising analyses were obtained again near Oubatche and in the Diahot valley in 1930, and at Poya and Bourail in 1935, but the gold does not appear to be in payable quantity. Antimony has been extracted near Canala on the east coast, and manganese near Gomen and Bourail, on the west coast; but they have been produced in small amount only, and have not proved profitable on any scale. The raising of the duties on the entry of manganese to Australia in 1922 tended to inhibit the development of this form of mining. The

exploitation of mercury, lead and zinc has been attempted at various times, but without success and the promise of renewed working of the two latter in 1930 by the Société des Mines du Diahot has not eventuated.

The coal, though its quantity has been stated to be large, is not of good quality. Mines at Dumbéa, suspended working since 1907 and reported to be reopening operations about 1930, have apparently not been successful, and hopes of important deposits in the basin of the Nondoué and especially in that of the Moindou, on the west coast, have been disappointed. A total concession of about 8,500 acres was acquired by the Société des Hauts-Fourneaux de Nouméa (Société Calédonia) with the aim of obtaining coke for its furnaces at Doniambo. Prospecting was begun in the Moindou basin in 1921, and in 1925 the mine 'Audaces Fortuna Juvat' was exploited. In 1927 production of 600 tons per month was reached, the coal being carried in lighters towed by a tug to Doniambo, and reduced in a coke plant using 50 per cent. of local coal mixed with the finer Australian coal. In 1928 a total production of 16,600 tons was attained, using electric power and compressed air. The coal was carried on a light railway about 3 miles long to the wharf. The personnel of the mine was 265, mainly Tonkinese. But the product was of too low grade for commercial development, and after a production of 21,000 tons in 1929 and 9,700 tons in 1930 the industry died away. In 1939 trials were made on an option over the Paula concession, but the results are not yet available. On the other hand, the imports of coal, mainly from Australia, but also from Belgium, New Zealand and (before the war) from Germany, have been increasing in accordance with the growing demands of the nickel industry, and from 1936 to 1939 averaged over 100,000 tons per annum.

Petroleum, found near Koumac on the west coast, has been extracted, but the industry has not developed. Gypsum, used in the beds of the local furnaces, has been extracted since 1917; there are two concessions worked, at Poya and on Lépredour island. Production in 1937 was 300 tons; in 1938, 1,070 tons; and in 1939, 213 tons. Phosphates, found on Walpole island, the Huon islands and the Chesterfield islands, have some importance, the resources of the last being estimated at 175,000 tons. But the amounts exported have been only a few thousand tons a year—for instance, an average of about 9,000 tons per annum in 1920-8, about 11,000 tons in 1935 and 2,000 tons in 1936.

On the whole, then, the exploitation of most of the mineral

resources of the country, despite the optimistic hopes entertained of them, has proved disappointing owing to the distance from overseas markets and the competition of more extensive and richer deposits elsewhere. The extraction of nickel and chrome, however, which is discussed in detail below, has proved of very great value.

Nickel

The amount of nickel ore in New Caledonia is large, and the country is the producer of second rank in the world. But though the export of the metal in various forms represents a very important item in the country's trade, it does not supply a high proportion of the world's output, the major share being contributed by Canada. Whereas Canada furnishes about 90 per cent. of the world's nickel, the International Nickel Company of Canada alone being responsible for more than 80 per cent., New Caledonia furnishes only about 7 per cent. The output and price of the New Caledonia product tends to be largely determined by that of Canada.

Earlier Production. The first discoveries of nickel in the island were made about 1865, and production began in 1875, exploitation on a large scale being first undertaken by the Société Le Nickel in 1889. The ore occurs in various forms, and at first it was all exported for treatment abroad. In 1910, however, the treating of the lower-grade ores in local furnaces began, thus diminishing greatly the cost of freight in export. The treated product, in which the valuable metal is concentrated into a sulphide, is known as *matte*. Initially this *matte* (of 'first fusion') had an approximate nickel content of 45 per cent. as against the nickel content of 4 to 6 per cent. in the crude ores; but after 1918, when the Bessemer process was introduced, giving a *matte* of 'second fusion', the metal content rose to approximately 75 per cent. (In 1939 it was 77 per cent.) The smelting process was begun by the Société des Hauts-Fourneaux de Nouméa, which by 1913 had at Doniambo point near Noumea 8 furnaces capable of producing 300 tons of *matte* per month. In the same year the Société Le Nickel established 2 furnaces at Thio with a capacity of 200 tons per month. Extensions were made to these at various times. As the export of *matte* grew to between 5,000 and 6,000 tons per annum the amount of crude ore exported steadily declined. From 115,000 tons in 1910 it fell to 93,000 tons in 1913, 48,000 tons in 1915, and 15,000 tons in 1918; and then became practically negligible for a number of years.

In 1927 the Société Le Nickel completed at Yaté in the south a



Plate 70. Tiébaghi mine, New Caledonia

For the most part open-cast, this is one of the richest chromite mines in the world.



Plate 71. Goro, New Caledonia

This aerial view, from the sea, shows part of the equipment installed by the Japanese for the extraction and shipment of iron ore.



Plate 72. Doniambo point, Noumea, New Caledonia

A general view of the nickel-smelting works, with Tir cove (Anse du Tir), a 'ship graveyard', in the background.



Plate 73. La Forestière sawmill, New Caledonia

This sawmill has recently been rebuilt and adapted for use by the military forces in New Caledonia.

hydro-electric plant of 22,500 h.p., depending on a barrage erected on the Yaté river, and proceeded to convert nickel ore to ferro-nickel by a process of fusion in electric furnaces. In 1927, 119 tons of ferro-nickel were produced, and in 1928, 543 tons, of 76 per cent. nickel content. In 1931, 638 tons of ferro-nickel, mainly of a metal content of from 55 to 58 per cent., were exported. (A smaller hydro-electric plant set up at Tao in 1909 began production in 1917, produced little, and was not continued.)

In 1928 the Société des Hauts-Fourneaux—now controlling a group of furnaces and coal mines, a coke plant, a foundry, repair forges and an electricity plant—modernized and extended its equipment, enlarged its capital from 20 million to 50 million francs, and changed its title to the Société Calédonia. In the same year a new company, the Société Minières et Metallurgiques de L'Océanie, founded in Paris with a capital of 2 million francs, began operations in the south, primarily in nickel.

Recent Developments. In 1930 the Société Calédonia was re-organized, and with the onset of the commercial depression and fall of prices this company and the Société Le Nickel combined under the title of the Société Calédonickel, with a capital of 10 million francs, the Bank of Indo-China providing the president of the administrative council. To meet the crisis further the 8 mining centres then operating were reduced to 3—at Thio, Bourail and Koné—and the furnaces at Thio were closed down, all production of *matte* being concentrated in the Noumea plant (Plate 72). In 1934 the hydro-electric plant for the production of ferro-nickel at Yaté was also closed. Nickel, however, did not suffer so severely as chrome in this period. Though a fall occurred in the export of *matte* from the 1930 record figure of 6,743 tons to slightly below 4,000 tons in 1932, recovery was rapid and in 1934 approximately 6,500 tons were exported. From this time onward the market for nickel improved markedly, in part due to the increased interest in steel for armaments. In 1935 and 1936 several new mines were opened, though that at Bourail, almost exhausted, had ceased working in 1933.

Japanese Interests. In the last few years the export of crude nickel ore has revived again, due in part to German demand, but mainly to the pressing needs of Japan for nickel. A purely nominal export of ore from 1930 to 1935 rose to over 5,000 tons in 1936, when Japan took three-quarters and Germany most of the remainder; to 32,000 in 1938, when Japan and Germany shared the product almost equally; and to nearly 50,000 tons in 1939, when Japan took four-

fifths. Since then till near the end of 1941, all the export of nickel ore, which has an average metal content of 4.1 per cent., went to Japan. The Japanese importer was the Nippon Kogyo Kaisha, apparently a subsidiary of the Nippon Nickel Kaisha, the only producer of metallic nickel in Japan. Before 1939 the Nickel A.G. (Iserlohn)

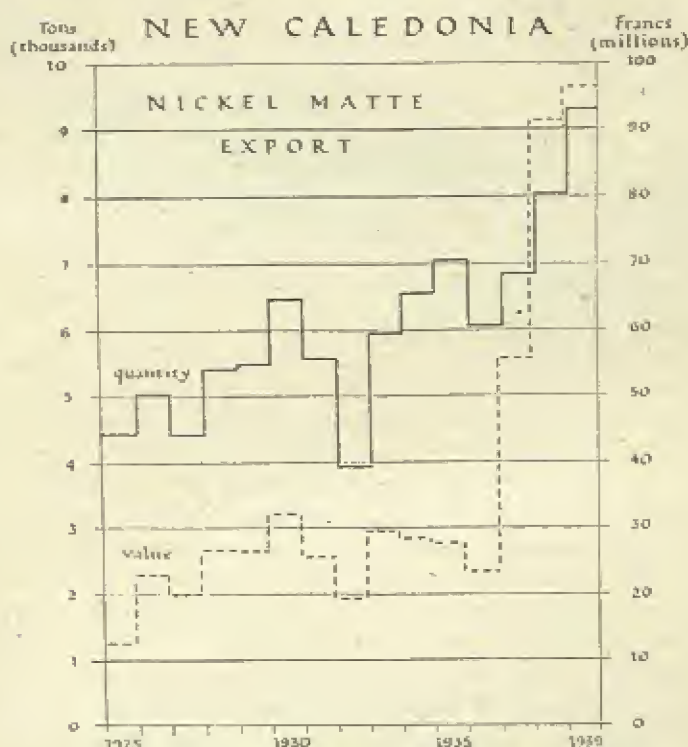


Fig. 152. Export of nickel matte, New Caledonia, 1925-39

Quantities in metric tons. Based mainly on: (1) G. A. Roush (editor), *The Mineral Industry*, pp. 424, 430 (New York and London, 1939); (2) *L'Océanie Française*, various years (Paris); (3) *Pacific Islands Year Book*, p. 372 (Sydney, 1942).

works in Germany were controlled by the French Société Le Nickel and used mainly New Caledonia ore.

Japan's interest in the New Caledonian nickel industry has grown considerably in the last few years in common with her increased interest in other nickel-producing countries. The capital for one new mine opened in 1936 was provided by Japanese, and in 1939 another new mine, the Yamato, was opened at Koua by the Société Minière de L'Océanie, a Japanese firm.

Commercial Importance. The nickel resources of New Caledonia show no sign of exhaustion as yet. Before the war of 1914 they contributed roughly about 40 per cent. of the value of the total exports from the country, and though their economic importance has declined at times since then, they have recently shown a marked increase. In 1936 the exports of nickel represented 45 per cent. of the total value of exports from the colony; by 1939 they had risen to 68 per cent. The quantity and value of nickel *matte* exported in recent years are shown in Fig. 152. Between 1931 and 1934 the *matte* was exported to France and Belgium in roughly equal proportions, the Société Le Nickel having its factories at Le Havre and the Société Calédonia at Antwerp. In 1935 the export went entirely to France, and from then France till 1940 continued to take the major share.

Chromite

New Caledonia is an important source of chromium, formerly taking fifth or sixth place in the ranks of the world's producers. But though the volume of production from the island has not radically changed during the last decade, New Caledonia now has dropped to about seventh place, and from providing 10 per cent. or more of world output now provides about 5 per cent. This has been due partly to the development of Russian resources, but largely to the rise of the Philippines from a negligible beginning in 1935 to the position of one of the leading producers of the metal.

Production. Chrome ore is found in New Caledonia in the form of an oxide, chromite. Production is undertaken from two sources: the mines in the north of the colony, particularly in the region of the Dôme de Tiébaghi (Plate 70), operated by companies with large



Fig. 153. Tiébaghi massif, New Caledonia.

Looking north-east, Port Paongoumène is in the bay to the left. Based on W. M. Davis, *Les Côtes et Les Récifs Coralliens de la Nouvelle-Calédonie*, fig. 40, p. 49 (Paris, 1926).

capital, with both open and subterranean workings developed by continued exploitation; and mines of the smaller interests, of the open type, found in various parts of the colony, but particularly in the south, near the Plaine des Lacs. The mines of the first type have a more regular production and supply about 90 per cent. of the tonnage and 95 per cent. of the value of the total chrome exports. At the present time they comprise three groups. The most important is the Tiébaghi mine, operated by the Société La Tiébaghi, which is controlled by the Chrome Company, a British firm. It has been described often as the richest chromite mine in the world, but though this is erroneous, the mine has great resources. By 1927 it had produced 1,200,000 tons of ore, and was thought to contain still as much again. But though the quality of its ore is higher than that of the other mines, varying between 55 per cent. and 57 per cent. of chromite, its working expenses are considerable; in 1927 an elaborate programme of extension had been completed involving the driving of a tunnel 2,000 ft. long through hard rock to reach ore 250 ft. below the surface. Former workings by this company in the Pirogues bay region were abandoned in 1929 as no longer profitable. In 1939 the Tiébaghi mine produced 26,334 tons of ore (about 46 per cent. of the colony's production), but before 1920 it was producing at least 60-75 per cent. of the total output. This ore is shipped from Paagouméne (Fig. 153). The group of second importance at the present time, controlled by the Société Chimique du Chrome, in which the interests of the Mutual Chemical Company of America are concerned, includes the Fantoche mine at Néhoué and the Alpha mine on the Tiébaghi dome. The former produced, in 1939, 15,502 tons of ore (about 27 per cent. of the colony's output), but it is said that the deposits are now becoming exhausted and that activities will be transferred to the Alpha mine. The third group, the Société de l'Exploitation de la Mine Chagrin, composed of French and Australian interests, operates the Chagrin mine at Koumac; this mine, which has changed hands several times, normally delivers its output to the Société La Tiébaghi. In 1939 it produced 9,932 tons of ore, concentrated by sluicing to 56-57 per cent., and representing 17 per cent. of the colony's output. These main groups among them also hold several other concessions, some of which are worked as the market offers opportunity.

The smaller mines, which, however, are not always in regular production, have included at various times the Alice-Louise, inland from Ngo bay in the south; a mine started on Ouen island in 1930;

the G.R. 2H at Plum; the Franco at Pouembout; and the Elizabeth and the Sunbeam, inland from Pirogues bay. The latter pair were begun about 1930 by Japanese interests which used chromite commercially, to free them from control by middlemen. Like the Alice-Louise, these two mines have been helped in their production by utilization of the light railway built for the carriage of timber

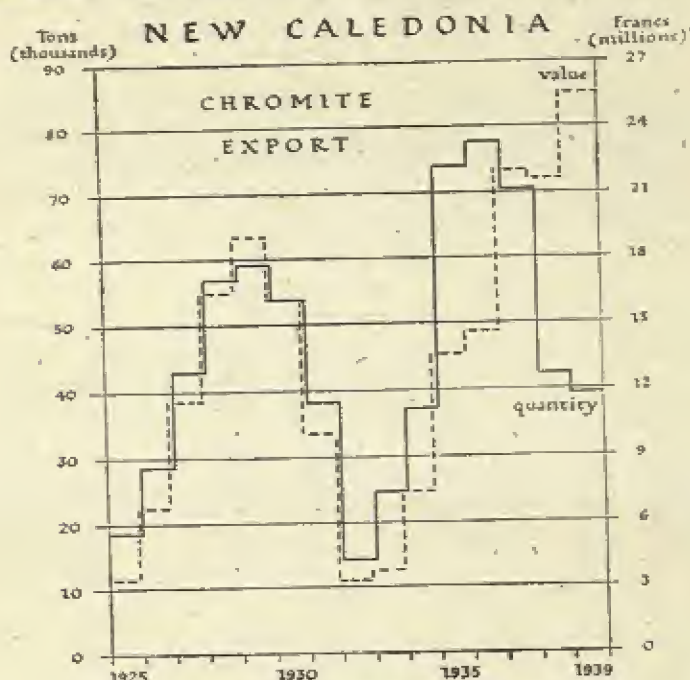


Fig. 154. Export of chromite, New Caledonia, 1925-39

Quantities in metric tons. Based mainly on: (1) G. A. Roush (editor), *The Mineral Industry*, p. 66 (New York and London, 1939); (2) *L'Océanie Française*, various years (Paris); (3) *Pacific Islands Year Book*, p. 372 (Sydney, 1942).

from the districts inland from Pirogues bay. Annual production from such small mines amounts to only a few hundred tons each.

Importance in Trade. Details of chromite exports in recent years are given in Fig. 154. Generally speaking, the export of chrome stands second to that of nickel as an item of major importance in New Caledonian trade. In 1930 and 1931 it supplied 20 per cent, and 17 per cent, respectively of the value of total exports from the colony; in 1937, 1938 and 1939 it supplied 26 per cent., 15 per cent. and 16 per cent, respectively. But while production has remained

relatively steady, the quantities actually exported have shown sharp fluctuations in the last twenty years. From an export of over 91,000 tons in 1920 the figure dropped to 15,000 tons in 1924 as the world demand for steel alloys fell away after the last war, then rose rapidly to 59,000 tons in 1929. The economic crisis saw a sharp decline again, and stocks accumulated while production continued. With general industrial expansion, and also a growing demand for armaments, the export rose rapidly again to a peak in 1936, since when there has been some falling away. On the whole, however, there has been an improvement in the last decade; the average annual export from 1921 to 1930 was approximately 34,200 metric tons as against an average annual export of 46,400 tons from 1931 to 1939.

Principal Destinations of Exports of Chromite from New Caledonia, 1930-9

Year	Exports from New Caledonia (in metric tons) to								Total Export	
	U.S.A.	Germany	Japan	France	Holland	Belgium	Australia	Other Countries	Metric Tons	Francs
1930	32,310	(a)	—	2,117	16,510	2,456	253	—	53,522	16,136,000
1931	30,018	—	510	1,040	5,689	—	—	1,526	38,273	10,303,000
1932	8,180	5,490	—	—	—	—	360	—	14,235	3,316,000
1933	15,394	—	1,342	—	—	7,823	—	—	24,564	3,702,000
1934	29,369	—	1,445	457	—	11,633	306	—	37,210	7,435,000
1935	61,348	—	1,612	—	—	9,246	1,745	—	73,971	13,672,000
1936	58,248	—	1,310	7,000	7,720	—	480	2,000	77,768	14,721,000
1937	61,500	—	1,895	3,302	—	—	3,212	—	69,910	22,015,000
1938	24,588	7,315	139	6,664	—	—	3,566	—	42,272	21,653,000
1939	18,892	13,513	—	3,607	—	—	3,368	—	39,379	25,358,000
1940	55,394	—	1,678	—	—	—	—	2,532	59,604	?

Based on: G. A. Roush (editor), *The Mineral Industry during 1941*, p. 68 (New York and London, 1942); *L'Océanie Française*, *passim* (Paris, 1931-40); Ministère des Travaux Publics, *Statistique de l'Industrie Minière*, etc., 2me fasc. (Paris, 1938); official report on New Caledonia for 1939 (unpublished, Noumea).

The above figures must be taken as merely approximate, owing to discrepancy between the various sources. This may be partly due to a difference in attributed destinations of the ore. Thus, the 16,000-odd tons assigned to Holland for 1930 (*L'Océanie Française*, 1939, p. 32) is assigned to Germany (a) by *The Mineral Industry*, 1939, p. 75. The U.S.A. imports of crude chromite for 1934-8 from New Caledonia given in the U.S. Bureau of Mines *Minerals Year Book* (in long tons) differ considerably from the export figures (in long tons, converted from metric tons) from New Caledonia given by all other sources. Also the total chrome exports from New Caledonia are given by *Quin's Metal Handbook* at levels on the average about 2 per cent. lower than in the sources mentioned above.

By far the largest proportion of the export of chromite is taken by the United States, which with its great iron and steel industry is the world's largest consumer of chrome, though a negligible producer. From 1925 to 1929, the United States took on the average 6 per cent. of its requirements of chrome from New Caledonia; in

1934, 10 per cent.; in 1935, 22 per cent.; in 1936, 20 per cent.; in 1937, 9 per cent.; and in 1938, 8 per cent. The diminution in the last few years is due to the fact that the United States has been turning more to the new and nearer resources of the Philippines. Germany, the Low Countries, France, Japan and Australia have been the other main consumers of New Caledonian chromite. (Details for 1930-9 are given in the Table, p. 472.) Since the war all exports have gone to the United States and Australia.

AGRICULTURE

While the metamorphic rocks are productive of minerals they are generally unsuitable for agriculture and cattle-raising, for which the soil of the sedimentary deposits is more fitted. This is able to support many kinds of crops, including introduced pasture grasses. But it is said to be deficient in lime, phosphate and potassium, and it is probable that fertility has been reduced by considerable leaching through the action of the torrential rains. It seems clear that, like most tropical soils, its fertility has been over-estimated. Moreover, alternate floods and drought make agriculture difficult. It has been calculated that only about 1,375,000 acres, or one-third of the country, is suitable for agriculture, and that not much more than two-thirds of this consists of land of first and second quality, proper to cropping, the remainder being of third quality and suited only for pasturage.

Native Agriculture

Native agriculture still relies to a considerable extent upon the cultivation of the coconut palm, various kinds of yam and taro, and the banana. Nowadays advantage has been taken of the introduced manioc to provide a drought-resisting crop. Plantations of coffee, maize and cotton have also been made, and the native has often shown his experience by utilizing existing tree-cover as shade for the growing coffee plants, rather than clearing it away. He is thus able, it is said, to obtain a yield after 3 years instead of the 6 years for which the European must wait. The natives have also extended their coconut plantations, though they tend to plant the palms too thickly together.

Native production of crops for the commercial market has shown a considerable increase over the last decade or so. An indication of this is given in Figs. 155, 156. In 1928 the natives owned about 5,000 cattle, 5,700 horses, 5,000 goats, 6,000 pigs and 370 sheep; their livestock holdings have probably increased since then.

At the present time the average native holding of land may be estimated at about $7\frac{1}{2}$ acres per head. The policy of agricultural development for the natives pursued by the administration has met with some criticism from the European colonists on the grounds that it was tending to deprive them of a valuable source of labour for their own plantations. But this is in itself an index to the measure of success that has been achieved.

General Situation

European agriculture has had only a limited success in New Caledonia. Cultivation of many types of crop has been attempted, but few have been effectively established commercially. The reasons have been partly over-optimism as to the continued fertility of the soil, lack of irrigation and manuring, pests, floods, and lack of technical skill; partly shortage of labour; and partly the long distance from overseas markets and consequent high freights. The potentialities for agricultural development of the country have often been stressed, but appeals for assistance to the industry—in the form of bounties to producers, subventions to freight, more agricultural credit and increased quotas in the French market—have also been made periodically.

On the technical side steps have been taken by the administration in the last few years to institute agricultural education at La Pérouse College at Noumea. To meet the labour difficulty workers from the Loyalty islands are employed seasonally for the harvest of cotton and coffee and on copra plantations; agriculture has also shared in the importation of indentured labour from Java. Agricultural credit has been furnished to a moderate extent through the Bank of Indo-China, and the pastoral industry assisted by an advance to the meat-preserving works at Ouaco from the Bank of Indo-China, guaranteed by the colony. Subventions to the cotton industry and bounties on the export of coffee and cotton have also been given by France at various times.

Agriculture in New Caledonia depends primarily upon coffee, copra and cotton, produced for export; and cattle-raising, to a large extent for the domestic market.

Coffee. Coffee plantations are extensive, especially in the north. It was estimated that in 1935 the plantations of Europeans covered approximately 7,000 acres and those of natives approximately 5,500 acres. The total of the latter has probably increased in recent years, though in 1935 the natives were asked not to extend their coffee

plantations farther in order to assure in part the necessary labour for the harvest on the European plantations.

The main varieties cultivated are *C. arabica*, on the hill slopes up to about 1,000 ft.; and *C. robusta*, on the alluvial plains of the east coast. A third type, known as 'excelsior', is grown mainly by natives. All are planted under cover of acacia or blackwood. Formerly the plantations suffered considerable loss from insect pests, and *C. robusta* was introduced from Java in 1911 to meet this difficulty. *C. arabica*, though it gives a lower yield (300-400 lb. per acre as against 500-700 lb.), still covers a greater area. At the beginning of 1940 it was estimated that plantations of this variety covered in all about 9,000 acres, with an average area of about 20 acres per plantation. But though it commands a higher price and greater tariff advantages, it has tended to give place to the cultivation of *robusta*, which is more resistant to disease, easier to harvest and of higher yield. While in 1935 about 940 tons of *arabica* were exported as against about 370 tons of *robusta*, in 1939 the proportion was about 640 tons to 580 tons. On a long view, the cultivation of *arabica* is deemed to be of more advantage to the colony, and the administration has tried to foster it by a differential bounty on exportation, and by a subsidy for new plantations of *arabica*. But in 1939 it was reported that no planter had claimed the latter. Many of the plantations, especially those owned by natives, are still of the mixed type.

The coffee of New Caledonia, favoured by the relatively dry climate, is of good quality. The majority of it is prepared for market on the plantation by simple methods involving a de-pulper, huller and grader, operated from a petrol engine or, more rarely, by water power. At Noumea there is an establishment for treating coffee from plantations not equipped with any machinery. Labour for cultivation and harvest is mainly Javanese; native labour is employed only for the harvest.

The quantity of coffee exported annually from 1921 to 1939 is shown in Fig. 155. Low figures for 1933-4 and 1938-9 were primarily due to the ravages of cyclones and floods. Figures for total production cannot be given since the extent of local consumption is not known. But on the average about one-third of the production is by natives.

A considerable stimulus to coffee production in New Caledonia was given by a French law of March 1931 for the encouragement of colonial production. *Inter alia*, this arranged for the distribution among colonial coffee producers of the proceeds of a special tax imposed on all coffee imported into France. This bounty, which in

the case of New Caledonia was modified in favour of *C. arabica* in 1938, has amounted so far to several million francs; it was allotted on an export basis after official verification. (The bounty was cancelled in August 1942.)

Copra. Copra was for many years the main agricultural product, but lately it has tended to take second place to coffee as far as value

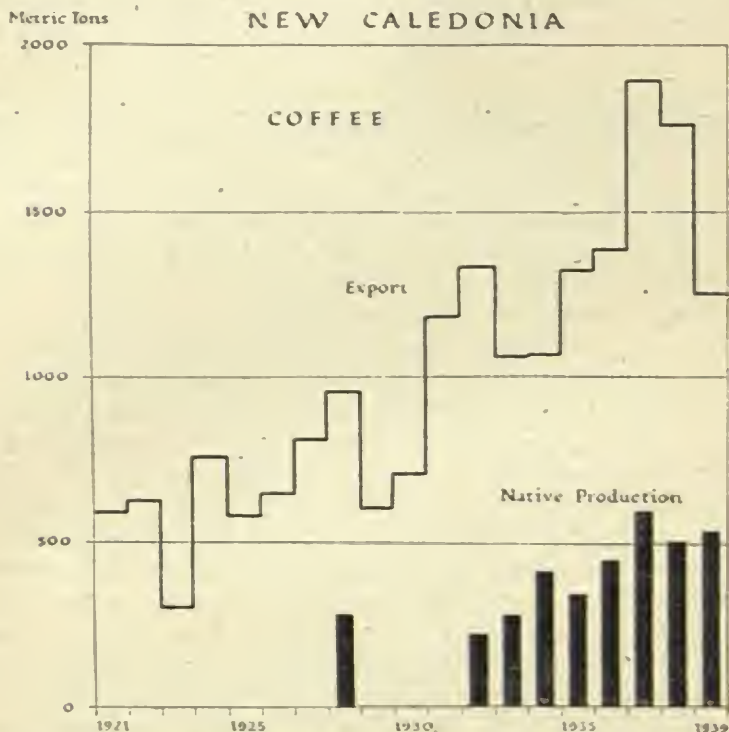


Fig. 155. Export of coffee (compared with native production), New Caledonia, 1921-39

Figures for native production are not obtainable for all years. Based on: (1) *L'Océanie Française* from 1927 onwards (Paris); (2) a French official report on New Caledonia for 1939 (unpublished, Noumea).

of the export is concerned. The average annual export from 1921 to 1930 was about 2,800 tons. During the last decade the average annual export has been only 2,425 tons, due in the first place to the effects of the economic depression, which left prices low for some years, and then to a cyclone in 1934. From 1933 the industry benefited somewhat from a bounty given to the production of vegetable oils

in the French colonies, but this was suppressed in August 1937. New plantations in recent years have been largely native-owned, and in 1939 the native share in the copra export was about 70 per cent. (Fig. 156).

Other Crops. The growing of cotton on a small scale in the colony was begun about 1870, but was not developed till shortly before the

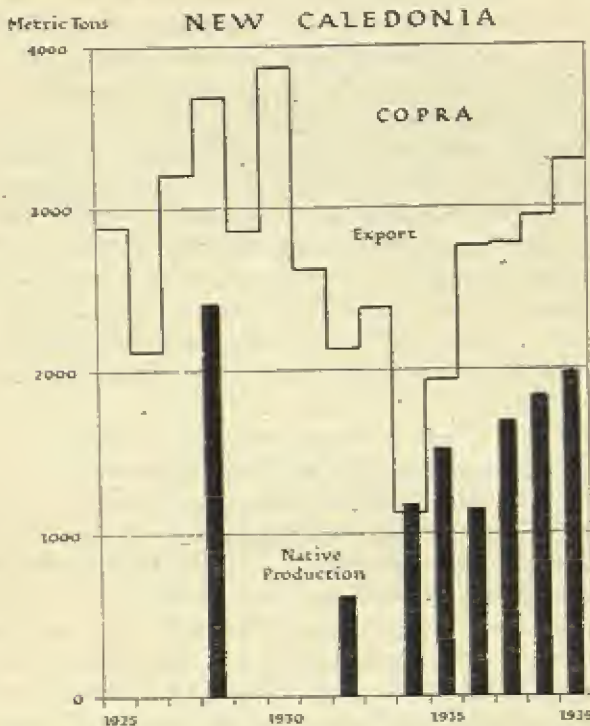


Fig. 156. Export of copra (compared with native production), New Caledonia, 1925-39

Figures for native production are not obtainable for all years. Based on *L'Océanie Française* from 1927 onwards (Paris).

last war, when the value of the export was about $\frac{1}{2}$ million francs per annum. (About one-third of this came from the New Hebrides.) The crop was of good quality, the price fetched being at one time 50 per cent. higher than that of good medium American cotton. The yield was also satisfactory, being nearly $\frac{1}{2}$ ton of cotton in seed per acre. Production continued to be considerable till about 1930; several hundred tons of ginned cotton and cotton in seed were

exported every year, and two ginning factories set up at Noumea. In 1926 the export value of ginned cotton alone was over 4 million francs. About this time, however, the product began to decline, and investigation showed that the plants were afflicted with several types of very harmful parasites. This, taken in conjunction with the fall of prices in the depression, caused production to decline rapidly. Despite a temporary subsidy by the French colonial Cotton Association and the administration in 1931, the export of cotton fell to less than 1 ton in 1935. Production and export have since remained at a nominal figure, though 1939 showed a slight rise, possibly in response to a new bounty offered by the administration.

Of recent years the growing of potatoes has shown marked progress, due largely to more efficient means of protecting the plants from pests. Normal consumption of potatoes in the colony is between 700 and 800 tons a year, and whereas formerly they were all imported from Australia, in 1939 the colony produced more than half this quantity. Since there is immediate prospect of fulfilling all local requirements, a surtax has been placed on Australian potatoes, and it is held that only the seed (about 80 tons per annum) will henceforth need to be imported.

Maize is a crop of some local importance, though it is not exported. Two crops a year are obtained, and the yield is about 2 tons per acre for the first two years, falling to about 1 ton per acre in subsequent years. To some extent it replaces for domestic consumption the grains of the European temperate zone. The natives produce several hundred tons of maize a year.

Other crops tried have been less successful. Rice was thought at one time to be capable of great development, but the amount of land and the labour available for it are comparatively limited. A yield of about 1 ton per acre is obtained. The crop—perhaps amounting to 100 tons or so—is consumed locally. Tobacco has been tried, but has not given satisfactory commercial results. Rubber was grown and exported on a small scale in the early years of this century, but appears now to have been abandoned. Excellent sugar was produced soon after European settlement began—a mill set up near Bourail had an output of 80 tons in 1868—but, faced with the competition of Fiji and Queensland, the industry dwindled. A small amount of rum is still manufactured at the Saint Louis mission station near Noumea. Manioc is a crop of some value in the local economy, both as providing a root food and as a source of tapioca, but it has no export importance. Its advantage is that despite its low food value it

is drought-resisting, which explains its adoption here, as in many other Pacific islands. Experiments have also been made with vanilla and with pineapples, but neither has developed as an item of any economic importance. Owing to the war, renewed efforts are being made to develop the cultivation of rice and tobacco, and experiments are being made with wheat.

Pastoralism

The pastoral industry, taking advantage of the large savannah areas with their native grasses, has occupied an important position since the early days of the colony. By 1869 there were already 6,500 cattle in the country, and by 1939 there were 103,100. These cattle, which are mainly cross-bred from Australian and French stock, occupy large runs totalling more than a million acres. They furnish the local meat market at a rate varying between 6,000 and 8,000 head per annum, and also supply the meat-preserving works at Ouaco (Plate 67). The greater part of the products from this works is exported to France, French colonies, the New Hebrides and Australia. Australian capital is invested both in pastoral property and in meat-preserving works, including one at Muéo, now closed.

On the average, 370 tons of meat, 300 tons of hides and 100 tons of tallow were exported from New Caledonia during the period 1921-30. From 1930 onwards, however, the pastoral industry suffered heavily. The economic crisis led to the repatriation of several thousand Javanese and Tonkinese, and to restriction of consumption by the colonists, thus lessening appreciably the internal demand for meat. The external market for tinned meat and other products also fell away to a very low level. The result was that by 1934 the number of cattle had increased to over 118,000 head. In this year it was reported that good freshly killed beef was selling in Noumea at the equivalent of 1d. per lb., and that pastoralists could not get more than the equivalent of £1 or 25s. per head for their beasts. As the result of efforts made to enlarge the external market, moderate contracts were secured for the supply of tinned meat to the penal administration of French Guiana and to the French army. Arrangements were made by the government of New Caledonia with the meat company whereby the latter obtained an advance from the Bank of Indo-China and contracted to take a quantity of cattle from the pastoralists each year. Under these arrangements, guaranteed by the administration, 2,500 head of cattle were delivered to the meat company in 1935, and smaller numbers in the succeeding

years, as meat prices tended to rise. In the last few years before the war the increased activity in the mining industry stimulated the local meat market, and the price per kilogram to the pastoralist rose from 1.25 francs to 2 francs and even 3 francs. This led to some diversion of cattle from the meat company to the local market. In 1938, 490 tons of meat, 317 tons of cattle hides and 275 tons of tallow were exported; in 1939 the quantities had fallen very considerably. One result of the depression was an increase of brushwood and weed in the pastures; the introduction of a parasite to destroy the prolific red lantana, however, appears to have been effective.

The number of sheep in the colony has never been large. In 1869 there were about 8,500 head, but in 1939 there were only 5,000. One of the reasons for this is the difficulty created by the *Andropogon* grass, common in the pastures; the awns become entangled in the sheep's wool, causing ulceration of the flesh and sometimes the death of the animal. Horses are important in the colony both for cattle-herding and communication. In 1869 there were 6,000 of them, and in 1939, 9,000. There were also 7,800 pigs and 8,300 goats in the colony in 1939; they are reared mainly by natives.

FORESTRY

Though there are large areas of forest country in New Caledonia (Fig. 139) exploitation is rendered difficult by the precipitous nature of much of the terrain. The best forest areas are in the south-west of the island, on the head catchments of the rivers in the Prony bay district. The country is rough, and the rivers treacherous in flood time. The main timber consists of: kauri pine (similar to the well-known New Zealand timber of that name, but said to be of even better quality); New Caledonian pine (species of *Araucaria*); gum oak (*chêne gomme*, *Spermolepis gummifera*); red oak (*chêne rouge*); white oak (*chêne blanc*); *tamanou* (*Calophyllum*); and acacia. These trees grow to good size, some large kauri being over 20 ft. in girth. The kauri is an excellent building timber; the gum oak, a very hard red timber resembling the blue gum of Australia though not a eucalypt, is also used for building. The red oak is also a hard timber, and very strong; the white oak bends well and is used for shafts and in boat-building. Acacia and *tamanou*, both beautifully figured woods, are used to a small extent for inlaying furniture.

Exploitation of these timbers has been undertaken by several companies, the principal of which is the Nouvelle Compagnie

Forestièrè Calédoniennè, holding a concession of about 35,000 acres, and owning sawmills (Plate 73) and a light railway about 20 miles long leading down to Prony bay. This company, which exported most of its timber to Australia, practically closed down in 1932, owing to the fall in the value of the Australian pound and to increased import duties imposed by Australia. In 1938, however, it started production again, and for twelve months in 1939-40 cut 120,000 cubic ft. of timber, of which about one-seventh went to the local market and the remainder was exported. Two other companies, Le Kaori and L'Oregon, have each a sawmill at Noumea. Le Kaori formerly worked in native timber and L'Oregon in imported timber; but for some years after the depression both handled only material imported from America. Recently, however, these companies have turned attention to gum oak and native pine as well.

The cutting of sandalwood, once an important item in the economy of the colony, is now practically negligible owing to exhaustion of supplies; in 1939 only 7 tons of this wood were exported. A tree of some economic importance in the colony is the *niaouli* (*Melaleuca leucadendron*), a broad-leaved paper-bark, which grows in profusion, especially in the savannah country. The timber is used for fence posts and boat knees, and from the leaves an oil resembling that of eucalyptus is distilled. Under the name of *goménol* (from Gomen in the north-west)—elsewhere known as cajeput oil—it is exported, to the amount of about 20 tons per annum, at a value of about $\frac{1}{2}$ million francs before the war.

FISHING

Fish are plentiful on the reefs round New Caledonia and the neighbouring islands, but the supply which comes on the Noumea market is scarce and dear. In recent years the number of fishing boats decreased, and many of the Japanese fishermen went to the mines, where they were in demand and received higher remuneration. Attempts to establish a refrigeration industry in fish have not been successful, due partly to the indifference of the local market to the product, and partly to the inadequacy of transport and the lack of facilities at the depot. There is no export of fish.

The principal commercial product of the New Caledonian fisheries is trochus shell (from which pearl buttons, etc., are made). The trochus was formerly plentiful, but exploitation by French, Japanese and natives reduced the supply in the early years of this century. Regulations were introduced for a close season and a minimum size

of shell to be taken, and the industry recovered to some extent. In 1935, 336 tons of shell were exported, at a value of over $1\frac{1}{4}$ million francs. In 1936 the seasonal restrictions were lifted, and 759 tons were exported, of a value of over $3\frac{1}{2}$ million francs. In 1937, 568 tons of shell were exported, and in 1938, 575 tons, at a value of over 4 million francs in each case. But exhaustion of the more accessible supplies reduced the quantity in 1939 to 429 tons, of a value of $3\frac{3}{4}$ million francs.

A small amount of *bêche-de-mer* is also exported each year, but the waters of New Caledonia are deficient in the large type which commands the highest price, and the methods of preparation are not well suited to the demand. Turtles are abundant, especially at the Huon and Chesterfield islands, but are not important commercially.

INDUSTRIES

Among the industrial plants established in the colony are blast furnaces for smelting nickel ore (Plate 72), a meat-preserving works, timber mills, a barking mill for coffee, a grain storage and cleaning depot, distilleries for the manufacture of *niaouli* essence, and several printing establishments.

The smelting works of the Société Calédonickel are capable of undertaking engineering work, though before the war much of the plant was old and in poor condition except in the pattern-making shop. Iron castings up to 2 tons and non-ferrous castings up to 10 cwt. have been made there. Another firm in Bayonnaise cove has electric welding and oxy-acetylene cutting plant. The electric power plant for Noumea, near the Grand Quai, has a generating plant of 3 diesel engines, 2 being of 250 h.p. and 1 of 150 h.p.; distribution is at 120 volts.

COMMERCE

Though it is evident that New Caledonia has considerable natural wealth, and a great future has often been predicted for the colony, its commercial development has been retarded by a number of factors. These include: distance from large overseas markets; poverty of interior communications; lack of a large industrious native population to provide labour and internal markets; residual effects of the penal system; insufficiency of coal resources for the mineral industry; lack of capital; and restrictive tariffs imposed from the metropolitan country.

Lack of capital has always hampered the development of New Caledonia, as of most other colonies. Settlement of the colony has been assisted by granting to French citizens free steamer passage from Europe at state expense, with the proviso that every such emigrant must possess a minimum capital of 5,000 francs or be assured of employment on arrival. A loan was raised by the colony in 1909 to facilitate public works, and others have been raised since. But the absence of a 'colonial fund' for French possessions has been felt, and the *crédit colonial* established in 1935 did little to improve matters, since the total capital was only 20 million francs, and most of this was contributed by the banks of issue in the colonies themselves.

The tariff policy also has been unsatisfactory. The trade of New Caledonia has important natural outlets in Australia and New Zealand, which offer a market for her mineral products. They are also a source of supply for food and manufactured goods. On both sides, however, the movement of tariffs has tended to inhibit this commercial relationship. Australia and New Zealand offered little inducement to New Caledonia, the majority of whose exports therefore went to Europe and the United States, while often 50 per cent. or more of her imports came from France. And the jealous attitude of France herself not only repressed the growing Pacific trade of the colony, but also put New Caledonia in a state of inferiority in the French market. Under the French tariff policy from 1892 to 1928 New Caledonia was in the group of 'assimilated' colonies, with free trade both ways with France, though the French tariff applied to her foreign imports. In 1928, when the classification was revised, New Caledonia was placed in effect in the 'non-assimilated' group. Free entry into France was given to some types of goods from New Caledonia, and on others the minimum tariffs granted to 'most-favoured nations' were imposed. The system of import duties gave preference to French goods. A tariff proposed by the local *Conseil Général* was rejected by France as being insufficiently protectionist. Since then, local opinion has grown against New Caledonia being a reserved market for the mother country, and the importance of the Australian connection in particular has been stressed. In September 1940 the local administration abolished the general tariff against Australian products, and reduced the minimum tariff in some cases; an agreement was also signed for the exchange of nickel *matte* against Australian goods.

On the other hand, the colony has continually sought support

from the mother country in the disposal of its agricultural produce, Bounties on the production of copra, coffee and cotton have been demanded, and at times obtained, from special taxes imposed in France itself; complaints have often been made about the extent to which France and other French colonies supply their wants from foreign countries competing with New Caledonia; and the aid of the French government has been enlisted in securing contracts for the disposal of meat. At times, indeed, it has appeared as if financial aid from the mother country has been conceived not as a temporary stimulus to aid the colonial agriculture to establish itself, but as a tribute due to the colonists for their sacrifice in isolating themselves from Europe. The precarious situation of New Caledonia agriculture, in particular, was brought out by the economic crisis of 1931-2.

Annual Value of New Caledonia Trade, 1908-39
(in thousands of francs)

Year	1 Exports	2 Imports	3 Total trade (francs)	4 Coefficient of devaluation of franc from gold basis	5 Total trade (gold values)
1908	10,111	9,307	19,418	1	19,418
1913	15,338	17,708	33,046	1	33,046
1920	43,043	47,472	90,515	2.15	40,200
1923	32,008	49,198	81,206	3.11	26,433
1928	98,844	159,939	258,783	4.96	52,174
1930	80,898	144,721	225,619	4.92	45,857
1931	64,073	91,689	155,762	4.92	31,659
1932	56,161	50,863	107,024	4.92	21,752
1933	68,508	57,829	126,337	4.92	25,678
1934	67,399	55,458	122,857	4.92	24,970
1935	75,058	55,300	130,358	4.92	26,495
1936	72,270	61,490	133,760	5.40	24,770
1937	107,804	107,190	214,994	8.15	26,379
1938	149,862	162,675	312,537	11.40	27,414
1939	159,506	190,054	349,560	13.82	25,294

Based on an official report on New Caledonia for 1939 (unpublished, Noumea). Columns 1, 2, 3 show trade figures as annually recorded; column 5 shows comparative values of the total trade, making allowance for changes in the value of the franc.

The nominal value of New Caledonia trade, as shown in column 3 of the accompanying Table, has multiplied tenfold since 1913, and has increased by about 50 per cent. since 1930. But when the extent of the devaluation of the franc in terms of gold is taken into con-

sideration it is seen that in reality trade increased fairly regularly from 1908 to 1928, then declined rapidly until 1932, and since 1933 has remained at a level approximately 20 per cent. below that of 1913 (column 5 of the Table). Though from 1932 to 1937 imports were rather below exports in value, in 1938 and 1939 the balance was reversed.

The principal exports from the colony are nickel, chromite, coffee, copra, meat, hides, timber and trochus shell. The quantities and values for two recent years are shown in the accompanying Table.

Principal Exports from New Caledonia, 1938 and 1939

Commodity	1938		1939	
	Metric tons	Francs	Metric tons	Francs
Nickel matte	8,032	91,382,000	9,302	96,522,000
Nickel ore	32,492	5,231,000	49,396	9,237,000
Chromite	42,272	21,623,000	39,379	25,538,000
Coffee	1,764	12,035,000	1,223	8,998,000
Copra	2,945	4,255,000	3,290	4,366,000
Meat (tinned)	497	3,000,000	186	1,419,000
Hides	453	1,554,000	530	2,166,000
Tallow	275	431,000	133	268,000
Trochus shell	570	4,020,000	429	3,254,000
Iron ore	nil	nil	91,499	1,257,000
Phosphate	1,758	246,000	4,186	528,000
Niaouli essence	21	521,000	24	471,000
Timber	—	831,000	—	955,000
Cotton	22	80,000	21	103,000
Sandalwood	10	26,000	7	16,000
Total export value	—	149,862,000	—	159,506,000

Based on an official report on New Caledonia for 1939 (unpublished, Noumea).

Before the war the nickel was taken mainly by France (and for a number of years by Belgium also) and Japan; the chromite was taken by the United States; and the coffee and copra by France.

The principal imports into the colony, in rough order of importance, include: oil from the United States; coal from Australia, Britain and Belgium; machinery from France, the United States, Japan and Belgium; flour and other foods, and hardware from Australia; rice and cement from Indo-China; iron goods, clothing, paper goods and other merchandise from France; sugar from Belgium and the Netherlands East Indies; timber from the United

States; wine from Algeria; and sulphur from Italy. In 1938 France supplied in value 37 per cent. and in 1939 35 per cent. of the goods imported into the colony. The French colonies supplied 7 per cent. in each year, and foreign countries 56 per cent. in 1938 and 58 per cent. in 1939. Of the foreign countries Australia was by far the largest supplier, with 30 per cent. of the value of total imports in

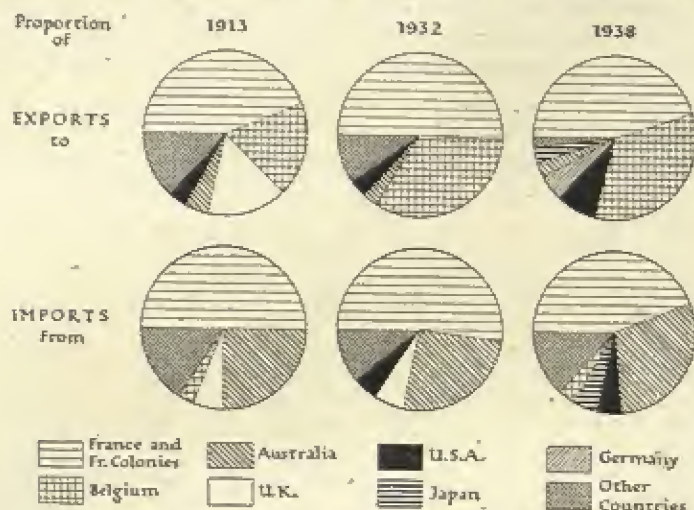


Fig. 157. Trade relations of New Caledonia

The diagram represents proportions of exports and imports by value; countries with proportions of less than 3 per cent. have been omitted. The French colonies have been included with France since their share in the trade is normally small. Based on: (1) *Foreign Office Peace Handbook*, no. 145, pp. 61-3 (London, 1920); (2) *Pacific Islands Year Book*, p. 372 (Sydney, 1936); (3) *L'Océanie Française* for 1939, pp. 42-4 (Paris).

1938, and 33 per cent. in 1939. The general state of New Caledonia trade at three sample years over a period of 25 years is shown in Fig. 157.

PORTS AND SETTLEMENTS (Figs. 140-7)

NOUMEA (Figs. 158, 159; Plates 74, 75)

Noumea (Nouméa), with a population of approximately 11,000 in 1936, including about 8,000 Europeans, is the capital of New Caledonia and the second largest town in the south Pacific islands.

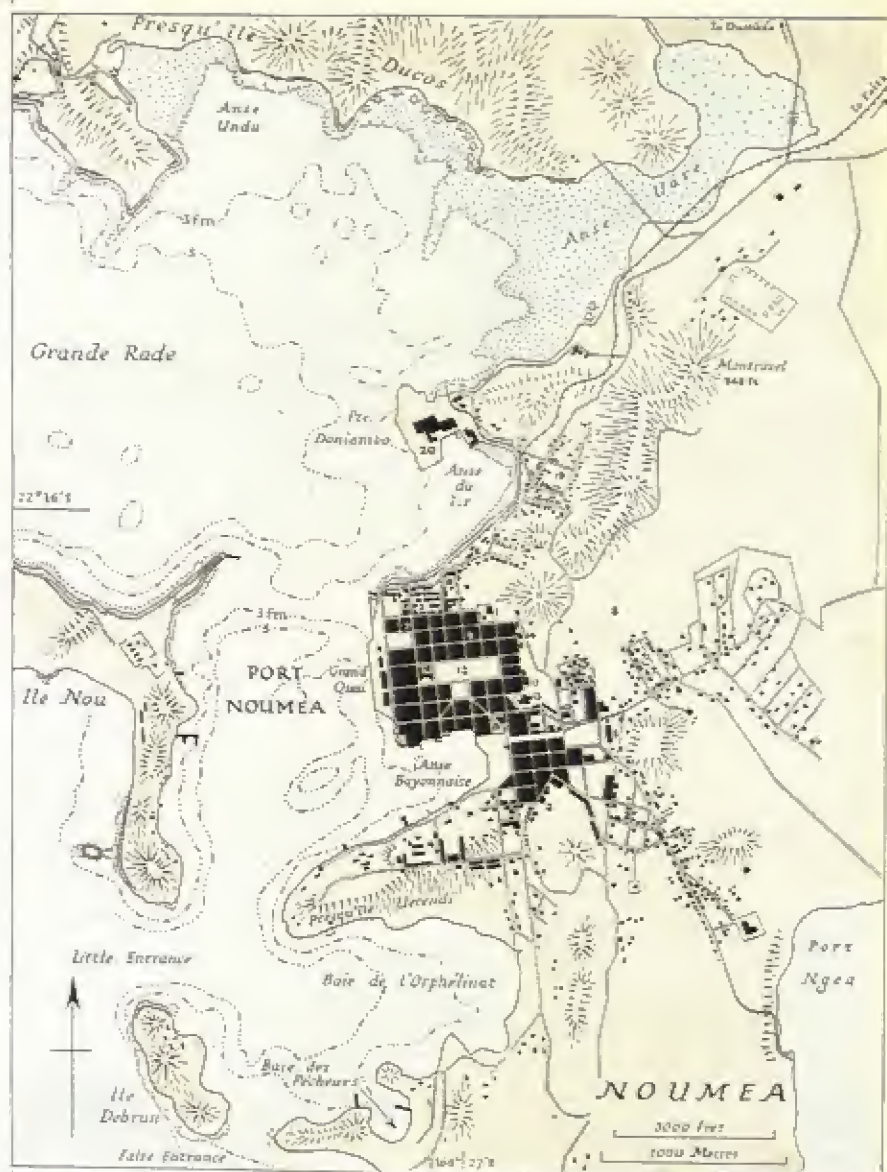


Fig. 158. Noumea: port plan

French names are given, except for Noumea, Little entrance and False entrance, which are taken from the Admiralty chart. (For Ngea and Pêcheurs read Ngéa and Pêcheurs.) Numbers refer to the following: 1. Government House and government offices; 2. High Commission offices; 3. Main barracks; 4. Artillery barracks; 5. Hospital; 6. Railway station; 7. Electric power station; 8. Waterworks; 9. W/T station; 10. Radio Noumea; 11. Semaphore; 12. Place des Cocotiers; 13. Cathedral (R.C.); 14. Protestant church; 15. Public library; 16. Girls' school; 17. Hotel du Pacifique; 19. Vallée des Colons; 20. Nickel-smelting works. Based on: (1) Admiralty charts nos. 480,2069; (2) other official sources.

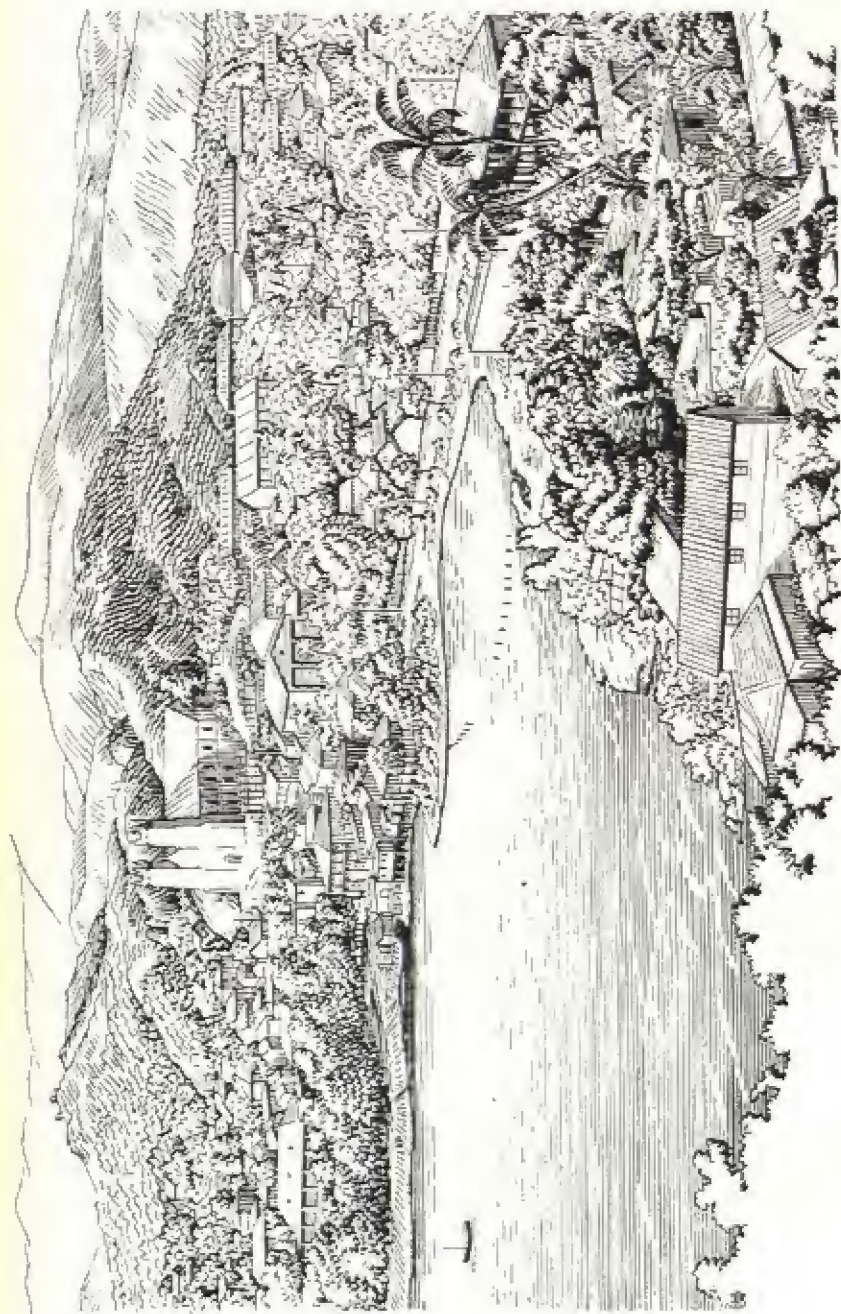


Fig. 159. Nouméa, New Caledonia

The large building in the centre is the cathedral. The inner part of Bayonnaise cove (right centre) has been reclaimed in recent years. Drawn from a photograph.

History

In 1854 the site of the town was chosen by Governor Tardy de Montravel. Though the harbour was excellent the land around it was unpromising, with many swamps and small hills. Settlement began around the base of Semaphore hill and stretched down to the site of the present colonial hospital, but till about 1860 it was mainly a small military establishment. As time passed the terrain was improved and the port developed. The land was drained and marshes filled, mainly by convict labour. Between 1875 and 1878, for instance, a hill known as 'la butte Conneau' was removed, and the spoil used for a filling of about 30 acres. In 1882 a beginning was made on the stone quay, which replaced older structures. Gradually part of the bay south of the town was filled in, and the rectangular street pattern extended. Suburbs were pushed out along valleys to the north-east and south. Nou island was also developed as a convict settlement, a coaling station and (recently) as a seaplane base; a submarine telegraph was laid to it from Noumea in 1873. With the growth of the mining industry, smelters were established, one at Chalcix point, opposite Debrun island, and another at Doniambo point, north of the town; the former has been abandoned for many years, but the latter has been extended recently, with increased accommodation for vessels alongside.

Port

Noumea is the most adequately equipped port in New Caledonia, and is the only port of entry in the colony.

It is formed by an indentation in the land south of Ducos peninsula, and is well sheltered. For the most part the shores of the bay are bordered by coral reef, but there are a number of easy approaches and landings. The harbour as a whole consists of two parts, the Great Road (*Grande Rade de Nouméa*) and Port Noumea itself. The former, lying immediately south of Ducos peninsula, is approached by a deep wide channel from the south-west—not shown on the map (Fig. 158)—passing north of Nou island; it has good anchorage for a number of large vessels. Port Noumea, to the south, between Nou island and the mainland, is connected with the Great Road by a channel, which can be used only by vessels drawing not more than 13 ft. The port itself is approached by Little entrance (Fig. 158) between Nou island and Debrun island; the channel is 400 yd. wide and $6\frac{1}{2}$ -8 fathoms deep. Another passage, False entrance, lies to the south

side of Debrun island, but is so shallow that only small boats can use it. The port has anchorage in $4\frac{1}{2}$ -8 fathoms. Tidal currents there are weak, but are stronger in Little entrance. Spring tides at the port rise about $5\frac{1}{2}$ ft., and neap tides about $4\frac{1}{2}$ ft.

Facilities. There is 2,650 ft. of quay space at and around the Grand Quai, of which only 1,460 ft. are available for vessels of any size, with depths of 18-26 ft. The quay is connected with the main railway system. Formerly there were cranes at the quayside, but at present it seems to be necessary for vessels to work with their own gear. On the west side of the port, on Nou island, is a mole 200 ft. long, with 26 ft. of water alongside; French naval vessels lie there when coaling. There are also small piers and jetties at various points around the harbour, and accommodation for vessels of some size at the quay of the nickel-smelting works at Doniambo point (Plate 72).

Small repairs may be carried out at the smelting works, and there is a patent slip, with a lifting capacity of 600 tons, in Pêcheurs bay, to the south of the port, but it is said to be in bad repair.

Normally a large stock of coal is maintained at the port, and supplied at the rate of about 25 tons per hour. There are 3 coal hulks, about 20 lighters and 6 steam tugs available. Some oil fuel is also kept. Supplies such as bread and meat can be obtained in moderate quantity, but vegetables and fruit are apt to be scarce. Water is to be had from a hose on the wharf and from a water-boat, but it should be boiled before being drunk.

The total coastal shipping registered at Noumea in 1939 comprised 9 tugs, 29 launches and 121 lighters, mostly of small size.

Town

The town of Noumea stands on flat or gently rising ground on the shores of the commodious land-locked harbour, and is encircled by low hills, the chief of which is Montravel, about 500 ft. high. The town has a good water supply, laid on from the head reaches of the Dumbéa river, and a sanitation system with open sewers. There are supplies of electric light and power, gas and ice. Meat is fairly plentiful, and there is a regular supply of fresh milk. From the open market, held early every morning near the main square (Place des Cocotiers), vegetables and fruit may be obtained; but fish is scarce. Three or four times a week boats from the Loyalty islands bring fruit and vegetables for sale by the quayside.

The streets of the town are well laid out on a rectangular plan, and are wide and lined with trees; all are macadamized, and some



Plate 74. General view of Noumea, New Caledonia

Looking across the town to the south-east, out to sea. The Grand Quai is on the right, with Uvea peninsula beyond it. The Place des Cocotiers is in the left centre. The photograph was taken in 1942.



Plate 75. Southern part of Noumea

The large rectangular space dotted with trees is the Place des Cocotiers. Above it, to the right, is the Cathedral. The photograph was taken in 1942.

have a bitumen surface as well. Transport is provided by commercial motor vehicles. Some of the buildings, including most of the main official ones, are of stone or concrete, but many, especially on the outskirts, are of wood. Single-storey buildings predominate. Among the most prominent structures are the Roman Catholic cathedral, the Protestant church (*temple*), the main barracks (*caserne Gally-Passebosc*) and the hospital. There are two large hotels, a branch of the Bank of Indo-China (*Banque de L'Indo-Chine*) and a number of well-stocked shops, including the large *Établissements Ballande* and *Maison Barrau*. Social amenities include a library, clubs and cinemas; the sandy beach at *Anse Vata*, a few miles south of the town, is a popular pleasure resort. The town is the main industrial centre of the colony, and is also the place of publication of several journals and a daily newspaper. Wireless facilities include a naval W/T station, a small radio-telephone station (on *Nou* island) and a broadcasting station (*Radio Nouméa*).

OTHER WEST COAST SETTLEMENTS

Dumbéa, about 10 miles to the north of *Noumea*, and *Paita*, about 10 miles north-west again, are settlements of moderate size, serving agricultural districts. Both are connected with *Noumea* by rail and road, *Paita* being the railway terminus. *Dumbéa* was formerly a mining centre, but now is a centre for the distillation of wood oils.

Bourail, near the coast to the north-west of *Noumea*, is the town of second importance in the colony. Its French population in 1936, together with that of *Poya*, was about 1,500, but it serves an area with a total population of about 8,000. There is no proper port. A boat landing, about 7 miles from the town, is used for landing heavy supplies by lighters, but most of the traffic reaches it by the main road from *Noumea*. Formerly the chief penal settlement, it is now the largest agricultural centre in the island, with a butter and cheese factory. The main street of the town is macadamized, with bitumen surface.

La Foa, a little to the south-east of *Bourail*, with a French population of about 600, is another important agricultural centre, especially for the cultivation of coffee. A small wharf of concrete there is used by lighters. *Poya*, to the north-west of *Bourail*, is a pastoral and coffee-growing centre, and gypsum is extracted in the vicinity. Other settlements of note still further to the north-west are *Koné*, an important nickel-mining and coffee-growing centre, with a popula-

tion of about 2,500 (about 500 French); and Voh, until recently the terminus of the daily motor-service from Noumea, also a nickel-mining centre, with a population of nearly 2,000 (about 600 French). At Koné there is a small wharf of reinforced concrete, used by lighters, and a small private wharf is at Voh.

Ouaco, still farther along the coast, has large cattle stations in the vicinity, and a large meat-preserving works (Plate 67); shipping is served by a small private wharf. Gomen and Koumac are centres for coconut plantations and pastoralism. Port Paagoumènc is a settlement on the north-west coast, with an open roadstead, serving the chrome mining area of Tiébaghi. The port has one or two piers for boat landing, and the use of 50-ton lighters can be obtained. Small repairs can be effected by the plant of the chrome company. A limited quantity of supplies can be obtained, and water can be had in casks from streams. Néhoué, a small settlement on the south side of Néhoué bay, is another chrome mining centre; shipping is served from a small private wharf.

NORTHERN SETTLEMENTS

Pam, on the eastern side of Pam bay, formerly a centre for cobalt and copper mining, is now a trading outlet for the Diahot valley. A large export of deerskins comes from this area, and the port is the most important trochus-fishing centre in the colony. Ouégoa, with a population of about 1,000, lying well up in the Diahot valley, is the largest settlement of the north, and serves a pastoral district.

EAST AND SOUTH-EAST COAST SETTLEMENTS

On the east coast the main settlements are nearly all agricultural centres; they serve a large proportion of the coffee and coconut plantations of the colony. The most important are Hienghène, Houailou and Canala, each with populations of about 2,000. Hienghène, with a fairly good harbour, is a centre for trochus fishing; the distillation of *niaouli* essence is also carried on there. Houailou and Canala are the east coast termini of two important transversal roads from the west coast; communication with Canala by sea is difficult, since the settlement is 2 miles up the river and only boats of the lightest draught can pass the shallows at the entrance. Other smaller settlements are Oubatche, Poindimié, Ponérihouen, Koué, Nakéty and Poro.

On the south-east coast the principal settlement is Thio (Fig. 160),

connected since 1935 by motor road with Noumea. It has a population of about 2,000 (about 450 French), and next to the Koné-Voh area is the most important centre for the nickel mining of the colony; smelting furnaces were formerly operated there. The port is an open roadstead, and vessels load in the stream from lighters, of which the mining company maintains normally about a dozen, each of about 50 tons. There is also a pier of reinforced concrete, about 150 yd. long, with a small crane. Cableways from the hills behind the port carry ore from the mines. From a port a light railway with a small steam-engine and a few trucks and carriages runs up the valley for some miles and meets one of the cableways and the road from Noumea to the town. The town itself is well-appointed, with a main street lined with trees, several stores, and hotels.

Farther to the south-east is Yaté, with a hydro-electric plant for



Fig. 160. Thio delta, New Caledonia

Viewed from the west side. Some of the buildings of the town can be seen in the foreground. Drawn from a photograph.

the conversion of nickel ore to ferro-nickel; this has ceased to operate since 1934, but the plant is still kept in working order. The nickel mines, situated about 3 miles from the port, are connected with it by a light railway. The port lies in an estuary of the Yaté river about 1 mile long, but the navigable channel is narrow and difficult. There is a concrete wharf for the use of lighters.

Goro, towards the south coast, though small, formerly had some importance as the settlement serving the (Japanese) iron mines. At the port, which has anchorage in 10-11 fathoms, there are the wharves of the mining company.

In addition to the facilities mentioned above, there are a few small wharves or jetties in some other harbours round the coast.

COMMUNICATIONS

Sea Communications

Before the war steamers of the Messageries Maritimes ran a service of about nine voyages a year from France to New Caledonia *via* the Panama Canal, Tahiti and the New Hebrides; this service was subsidized for carriage of mails by the French government. The Messageries Maritimes also ran a service of four voyages a year from Sydney to Noumea and on to the Loyalty islands and New Hebrides before return. Another vessel of the same line, which served the New Hebrides, also made two or three voyages to Uvea and Futuna annually. There was also a regular monthly service between Sydney and Noumea by another line; and vessels of the Société Le Nickel made a number of voyages between Noumea, Port Kembla and Sydney for the transport of coal and coke for the furnaces. Indo-China was in communication with New Caledonia by a Messageries Maritimes vessel running between Noumea and Saigon several times a year, while a Dutch vessel of the Royal Mail Packet line called regularly at Noumea every two months *en route* to Sydney or New Zealand from the Netherlands East Indies. From 1936 to 1941 Japanese vessels made irregular voyages from Japan to Noumea; their prime concern was the transport of nickel and iron ore. A number of British and American tourist vessels also called at Noumea.

Noumea is normally the only port open to external trade, but foreign vessels may be authorized to proceed to other ports on payment of certain dues. In 1939 Nêhoué, Goro, Koua, Boulari bay, Nakéty and Paagoumène were so visited, mainly for shipping metals. By a presidential decree of October 1913, the coastal trade of New Caledonia is reserved to vessels under the French flag.

	Year	Vessels	Tonnage
Entered	1937	140	361,409
	1938	145	363,763
Cleared	1937	142	361,511
	1938	140	350,075

Based on *L'Océanie Française*, 1938, p. 41; 1939, p. 44 (Paris).

Before the war a local service, subsidized by the colony, served alternately the two coasts of the island, 10 voyages being made

along each coast annually. A second service, also subsidized, served the Isle of Pines and the Loyalty islands, and also reinforced the coastal service of New Caledonia itself. The return of overseas shipping for New Caledonia in 1937 and 1938 is given in the Table on the previous page.

In addition nearly 500 vessels totalling 170,000 tons (including about 170 sailing vessels) were entered and cleared on local services. Apart from the shipping registered at Noumea (p. 488) there were in 1937 about 250 cutters in New Caledonian waters; most of them were engaged in trochus fishing.

Railways

Railway communication in New Caledonia is undeveloped. A metre-gauge, single-track railway, projected in 1895, had the first section from Noumea to Dumbéa opened for traffic in 1905. At the present time it has reached only as far as Paita, about 18 miles from Noumea. There is small prospect of the contemplated extension to Bourail (about 100 miles farther on) being carried through, since the development of motor traction has removed the need for it. Although the cost of the existing section was high, its utility was probably justified as a stage in the development of the colony, since for many years the road system was bad, and communication along the coast by sea was often interrupted by bad weather. But the line has always been run at a loss, and in January 1940 services were suspended on account of the defective state of the track. (The railway has recently been put in working order and reopened.) There are two bridges on the railway—one 4 miles from Noumea and the other across the Dumbéa river. Both are of steel construction. There are two tunnels on the line: one about 300 yd. long, about 6 miles from Noumea, the other, about the same length, about 4 miles from Paita. The rolling stock consists of 3 steam locomotives and about 25 carriages and trucks. Capacity is about 60 tons per train load.

In addition there is a well-ballasted track from the wharf at Yaté to the smelting works, a distance of 3 miles; 10 miles of track from the mines at Thio to the port; a line from the chromite dump at Tiébaghi to Port Paagoumène (which is also connected with the Tiébaghi mine by an aerial ropeway); and a light railway about 20 miles long leading down from the timber concessions in the south to Prony bay.

Roads (Fig. 161)

The road system of the colony has still much development before it, particularly along the east coast, where the terrain is more difficult and where there are nearly a dozen river ferries. Motor transport is still impossible between some of the settlements. But there is good road communication along most of the west coast. The roads were formerly divided into three main classes: *routes coloniales* (*chemins de grandes communications*), or first-class roads suitable for motor transport; *routes municipales*, or feeder roads, practicable for motor vehicles in most cases but often of indifferent surface; and *routes secondaires*, including cart roads and mule tracks. But the system of first-class roads has been steadily extended to include the improved feeder roads, and the line between them is not now so clearly defined. In 1940 there were about 960 miles of roads listed as suitable for wheeled traffic, of which about 610 miles were of first-class local standard and carried heavy motor transport. The most important section of the road system is the coast road from Noumea to Voh, in excellent condition, with an extension in fair order to Néhoué and Poume, making in all about 260 miles. There is also an extension from Noumea to Plum in the south. There are three important lateral roads across the island: from Bourail to Houailou, about

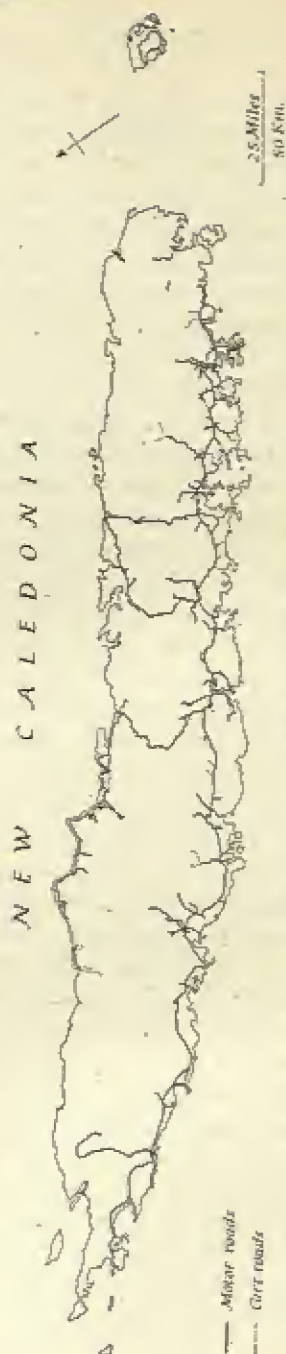


Fig. 161. New Caledonia: main road system

As in the middle of 1942. In addition to these main roads there is in many parts of the country a network of mule-tracks and foot-tracks. The relation of roads to settlements is shown in Figs. 140-7. Based on official sources.

25 miles; from La Foa to Canala, about 25 miles; and from Bouloupari to Thio, about 30 miles. All are typical mountain roads, and in 1942 they were unsuited to heavy or rapid traffic. That from Bourail to Houailou, with an extension to Ponérihouen, is the best.

In 1939, services by motor-bus and motor-truck, subsidized by the government, ran daily each way between Noumea and Voh; and three times a week between Bourail and Ponérihouen *via* Houailou. Other subsidized services using light cars and trucks ran three times a week between Voh and Néhoué; also at various intervals between Koumac and Poutme (in the north), Noumea and Plum (in the south), and Bouloupari and Canala. There was also a considerable amount of private goods traffic.

The motor vehicles in the colony in 1939 comprised: 313 heavy and light trucks; 13 motor-buses; 898 large cars; 147 small cars; and 233 motor-cycles.

Air Communications

Air facilities before the war were few. There was a seaplane base at Paddon cove, Nou island, near Noumea, utilized by Pan-American Airways for the trans-Pacific clipper service *en route* from San Francisco to Auckland. A meteorological station has been set up to facilitate the aerial traffic. There were several small landing grounds of indifferent surface. In the last few years air facilities have been greatly developed.

Signal Communications

New Caledonia had in 1939 a telegraph system with 43 bureaux and a telephone system with 3,243 miles of line and 685 installations. The wires are above ground, carried on wooden poles. There are postal facilities in more than 40 centres. A submarine cable connects Gomen on the north-west coast with Harvey bay in Queensland, but communication by this route has ceased since the establishment of a W/T station at Noumea.

In 1939 W/T stations comprised 2 short-wave and 4 long-wave installations. At Noumea the government had one transmitting and receiving station and one station for reception only. Communication was mainly with Saigon and Sydney. A broadcasting station (*Radio Nouméa*) gave short programmes. Pan-American Airways had private installations for aeronautical use. In the Loyalty islands, stations of low power had been installed at Tadine (Mare), Chépénéhé (Lifu) and on Uvea.

ISLE OF PINES

The Isle of Pines (known locally as Ile des Pins or Kunie) lies about 40 miles from the southern end of New Caledonia, in lat. $22^{\circ} 40' S$, long. $167^{\circ} 28' E$ (Fig. 147).

Physical Geography

The island is roughly quadrangular and is about 10 miles long by about 8 miles wide, with a total area of about 58 sq. miles, including Koutomo (Lesser Isle of Pines), which is separated from it by a narrow channel. The coastline is exceedingly irregular, being broken up into small bays with a fringing archipelago of small islands of coral of undercut 'mushroom' type, and many sandbanks, a few feet above sea level.

The island forms part of the same geological system as the mainland. Emerged coral is superimposed upon a serpentine base, which is evidently a prolongation of the massif of the southern part of New Caledonia. The sea between the island and the mainland is shallow and full of coral reefs and sandbanks, but there are two shipping channels, Havannah passage and Sarcelle passage.

The centre of the island is of serpentine, forming a plateau with a general level of about 350 ft. but rising at Nga peak to an altitude of 872 ft. The serpentine region, which at no point reaches the coast, is marked off from the coral zone by a fairly pronounced escarpment. The coral zone, which has a maximum elevation of about 100 ft., varies greatly in breadth and is generally overlaid by a scanty deposit of red earth. Water has undermined the coral rock in places and produced extensive caves, with stalactite and stalagmite formations.

The greater part of the plateau is covered with a heath-like vegetation, in which bracken is dominant over large areas, but with low scrub in some places. The typical vegetation of the coral zone is very different. It is much richer, with high forest in which species of banyan are conspicuous, and a dense undergrowth. The sandbanks are densely clothed with *Araucaria columnaris*, the slender pine, from which the island received its name when it was discovered by Cook's expedition in 1774.

There are a number of anchorages, the best being Kanumera cove and Kuto bay on the south-west side, offering good shelter to small vessels. Port Alcmène and Port Vao, on the south, are formed by a reef extending west from Koutomo; these two anchorages are secure

only in winds from the eastern half of the compass. Anchorage, with a watering place, is also given by Uamoo bay on the north-west; Gadji anchorage on the north side, and Ougo bay on the north-east, also afford temporary shelter.

Social and Economic Conditions

The population of the island in 1936 was 612, practically all natives. Their dwellings are all situated in the coral zone, and their cultivation frequently follows the line between the coral and the serpentine. The island has a fairly good road system, constructed originally by convict labour, but there are no motor vehicles in use. The main settlements are at Gadji, Ouro and Vao; the last is the principal trading centre. The economic products apart from copra are of no particular importance.

The native people are of the same type as those on the mainland, and the same system of administration and social services applies to them.

LOYALTY ISLANDS

The Loyalty islands, situated between lat. $20^{\circ} 16'$ and $21^{\circ} 40'$ S and long. $166^{\circ} 05'$ and $168^{\circ} 08'$ E, are a French possession, a dependency of New Caledonia. They are said to have been discovered by Captain Butler in the *Walpole* in 1800, or by the *Britannia* in 1803, but the first careful examination of them was made by Dumont d'Urville.

The group consists primarily of three large islands: Mare (Maré), Lifu (Lifou) and Uvea (Ouvéa). (The native names vary. The people of Lifu call their own island Drehu, and give Mare the name Mengöne and Uvea the name Eath; the people of Uvea call their own island Iai, and give Lifu the name Duok.) There are also a number of small islands and rocks, the most important being Tika, Ndoundouré and the Pleiades; the Beautemps-Beaupré islets, a little distance to the north-west of Uvea, and the Astrolabe reefs, farther still to the north-west, may also be regarded as part of the group. The group lies in a north-west and south-east direction, parallel to the long axis of New Caledonia.

PHYSICAL GEOGRAPHY

The islands are composed primarily of emerged corals—a few volcanic rocks have been stated to occur on Mare—and are comparatively low. Their elevation, however, becomes progressively

greater towards the south-east. Whereas the Astrolabe reefs are awash and Uvea has a maximum altitude of 100 ft., Lifu has a maximum altitude of 180 ft., and Mare has a mean altitude of about 300 ft., with a maximum of about 320 ft. This suggests a tilting of the ocean floor in fairly recent times. The soil on Mare and Lifu is of the red type common on coral limestone; it is a thin covering, except in pockets. That on Uvea is more sandy.

Water Supply and Vegetation

The climate of the Loyalty islands is of the same general type as that of New Caledonia (pp. 434-8), but owing to the low elevation rainfall is apt to be deficient at times (Fig. 138). Surface water is lacking because of the porous nature of the soil. In large caves in the high rocks of the weather side of Lifu deep pools exist; but elsewhere in former times holes were scooped in the leaning trunks of palm trees and rain water was guided by palm leaves into the cavities. Nowadays, with the introduction of crowbars, a well has been sunk in every village through the rock to a depth of 12-20 fathoms. But the water is often brackish and is still sometimes scarce.

The vegetation consists mainly of coconut palms near the coasts, but bananas, pandanus, sugar cane, papaya and other food plants grow inland, as well as some pines, banyan, and several types of hardwoods as well as grasses (p. 442).

Coasts and Anchorages

The coasts exposed to the south-east winds are generally steep, craggy cliffs, but elsewhere there are usually fairly gentle slopes towards the sea. On the lee side of Uvea there is a sandy beach forming the margin of the lagoon, and there are a number of sandy beaches also elsewhere, as on the south side of Mare.

Mare. Mare, the south-eastern island of the group, is in effect a large plateau about 300 ft. above sea level; it is about 20 miles long north and south, and about the same width east and west (Fig. 162).

The coast is indented by several broad bays. On the west side is Tadinou bay, about 1 mile long and 600 yd. wide, with anchorage in about 20 fathoms, off Tadine village; landing may be made there in a small creek. Coral reefs extend along the coast for some miles north of the bay, but coasting vessels anchor to the south-east of Netché (or Netieh) point, where there is a village. On the north-east side of the island is Ro bay, sheltered from all southerly winds,

with anchorage in 15 fathoms; landing here is easy on a sandy beach, from which paths lead to neighbouring villages. Eastward of Ro bay the coast trends north-eastward for about 5 miles to cape Roussin, the north point of the island. On the south side of the cape is Poane bay, large and open, with La Roche anchorage near the village of that name. This anchorage, in 20 fathoms, is indifferent owing to swell. The coast overlooking the roadstead is remarkable for several flat-topped hills and a bare vertical cylindrical rock. On the south

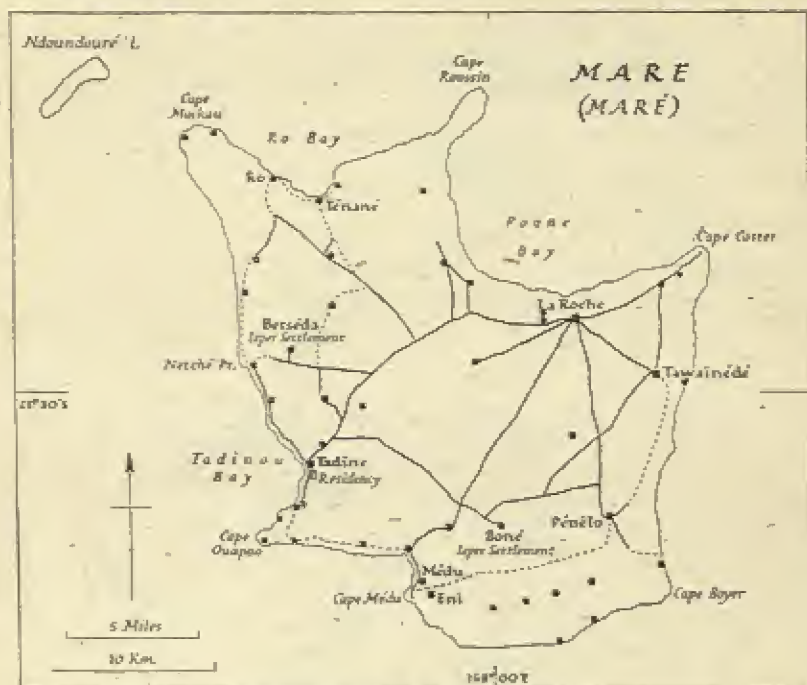


Fig. 162. Mare, Loyalty islands

Indications of coral and cliffs have been omitted. Based on official sources.

side of the island a bay off Médu offers shelter from northerly and easterly winds.

N'doundouré island, about 3 miles north-west of the north-west extremity of Mare, has two bare sloping mounds with low land between, giving it from a distance the appearance of two islands.

Leliogat and Uo are two small islands about 10 miles west-north-west of N'doundouré, each about $\frac{1}{2}$ mile in diameter and low. The former is almost bare; the latter is covered with pines.

Tika island, about 14 miles north of the north-west point of Mare, is composed of raised coral, and has a smooth level summit about 250 ft. high. The coastline is formed of perpendicular cliffs, and at the north-west end the elevated land stops about 500 yd. from the shore, leaving a small plain. On this is a village. There is sufficient

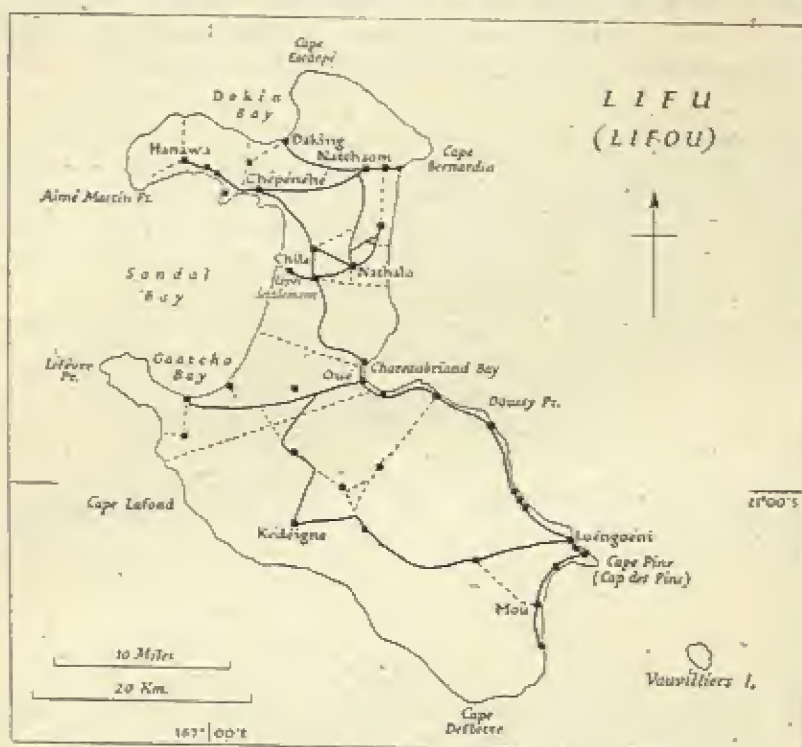


Fig. 163. Lifu, Loyalty islands

Indications of coral and cliffs have been omitted. There are variant forms of spelling of some of the place-names, even by French authorities. Based on official sources.

depth to give native boats shelter between the reef and the shore and a sandy beach makes landing easy.

Lifu. Lifu, the most important island of the Loyalty group, is about 33 miles in greatest length and 28 miles in greatest width (Fig. 163). From a distance it presents a succession of plains of about the same height. The coast is not deeply indented, but the main anchorages are in Dokin bay and Sandal bay. Dokin bay, 4 miles west of cape Escarpé, the northern extreme of the island, is sur-

rounded by perpendicular cliffs, with their summits covered with vegetation. In the south-west part the cliff stands back from the shore for a length of $\frac{1}{2}$ mile, leaving a level space planted with coconut palms. Anchorage on sand and coral is found over a space of a mile in 18-20 fathoms. There is landing on a sandy beach from which a steep path cut in the cliffs leads up to the village. Sandal bay, on the west of the island, has within its northern sector the bay of Chépénéhé, where the principal village of the island is situated, with

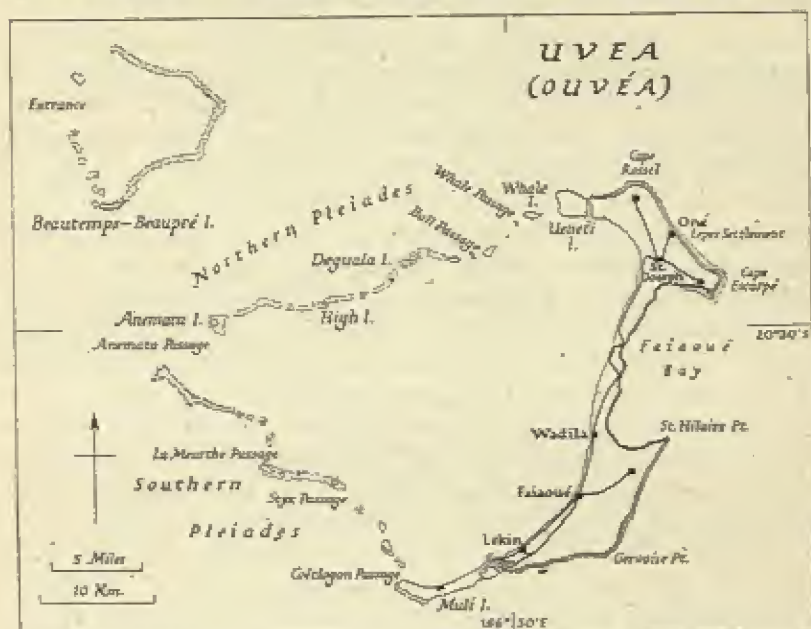


Fig. 164. Uvea, Loyalty islands

Not all coral reefs round the main island are shown. Based on: (1) Admiralty chart no. 3445; (2) other official sources.

the residence of the administrative official of the group. Chépénéhé bay gives best anchorage on the east side, but the holding ground is only moderate, and the anchorage is dangerous in south-westerly gales. There is a short landing stage at the foot of a path leading to the Residency. Gaatcha bay, in the south sector of Sandal bay, is probably the best sheltered anchorage in the Loyalty group. It is $2\frac{1}{2}$ miles across, and affords shelter from all winds from west-north-west through south to north-east. Anchorage is obtained in 14-15 fathoms.

Uvea. Uvea atoll is a group of closely connected islands and

reefs forming a triangle, with the main island at the base to the east and a large lagoon in the centre (Fig. 164). In this there are several anchorages, and there are a number of passages through the reefs.

Uvea island, the main one of the atoll, is about 22 miles long and is crescent-shaped; it has a breadth of 3 miles in places, but it is deeply indented on the east by Faiaoué bay. It is low, with a number of flat-topped hills in the north-west. For much of its length a wide ridge of sand, about 14 ft. above sea level, rises from the shore, and is the site of most of the dwellings. Inland from this ridge the ground slopes down again, forming a large swamp many miles in length and used for the cultivation of taro; it is a breeding-place of mosquitoes. The existence of this large depression in the centre of the island suggests that Uvea is a raised atoll. The island is thickly wooded, especially with coconut palms along the shore. There is no landing place on any part of the east coast of the island, owing to the surf on the fringing reef. On the west side, the best entrances through the reefs and islets are Bull passage on the north, Anemata passage on the west, and La Meurthe, Styx and Coëtlogon passages on the south-west. The last, which is excellent for steamships, leads east to Muli anchorage, the best that the island affords. This anchorage is sheltered from south winds and has depths of $5\frac{1}{2}$ fathoms, with moderate holding ground. The beach here affords easy landing, and water can be obtained from wells. Lekin and Faiaoué anchorages, farther to the north-east, are suitable only for small craft, and Uvea anchorage, off a village on the north-west side of the island, is poor.

Pleiades. The Northern Pleiades and Southern Pleiades are a chain of reefs and islets forming the north-western and south-western sides of the triangle of the atoll of Uvea. They are all low and flat. Some have little vegetation, but others, such as Ueneti, Deguala and Anemata, have coconut palms or other trees; Pine and some islets on the south side have stands of conifers.

There is good anchorage off the west side of Ueneti, and landing may be made on sandy beaches on most of the islets.

Beautemps-Beaupré. This atoll, lying about 7 miles north-west of Uvea atoll, consist of two islets and a number of reefs enclosing a lagoon about 7 miles across in any direction. The atoll was discovered by D'Entrecasteaux, who named it Iles Beautemps-Beaupré after his nautical surveyor. The main entrance into the lagoon is 5 miles north-westward of the main islet, and anchorage may be obtained in the south part of the lagoon in 12 fathoms.

The main islet, bearing the same name as the atoll and known

also as Heo, is about 1 mile long. There are sandy dunes with coarse grass at the north end, but the rest of the island is covered with coconut palms. The coast consists on the south side of slabs of coral rock, and on the north side of a coral cliff about 10 ft. high, with little sandy coves on the shore. Landing (which is possible only on the north side) is not made at any definite point; it is difficult owing to the sharp crumbly coral.

There is no fresh water on the island, and it is uninhabited. It is said to be the private property of the *petit chef* of St Joseph, at Uvea; he goes there periodically to fish.

SOCIAL AND ECONOMIC CONDITIONS

Population

The population of the Loyalty islands is approximately 11,000, about one-half of the people being inhabitants of Lifu. About 20 years ago it seemed as if the population was declining (p. 451), but in recent years a rising trend has appeared. Distribution of the population in terms of island of residence, with some indication of sex and age, is shown in the following Table, for 1931:

Island	Men	Women	Children	Total
Lifu	1,643	2,280	1,936	5,859
Mare	1,053	1,202	979	3,234
Uvea	589	732	616	1,937
Total	3,285	4,214	3,521	11,030

Based on *Pacific Islands Year Book*, p. 377 (Sydney, 1936). In the same publication for 1942 comparable figures are given for the census of 1936; they show an over-all decrease of roughly 10 per cent. except in the case of children on Uvea. These figures, however, do not correspond with those given in *L'Océanie Française*, 1938, p. 5 (Paris), which show a small increase of men and children, and a slight decrease of women, against the figures for 1931, with small increases of population on Lifu and Uvea, and a small decrease on Mare. (Included in the totals are about 200 Europeans.)

The excess of women in the Loyalty islands might seem to indicate considerable possibilities of population growth. But the position is complicated by the fact that the low ratio of men shown in the census figures is due primarily to the demand for them as sailors and as labourers in New Caledonia. Accurate estimation of the number of male absentees is not possible, but the number of Lifu men alone working in New Caledonia each year has been reckoned at 600. Their prolonged absence from home may well affect the birth rate.

People

The people of the Loyalty islands are mainly Melanesian. But there is a definite Polynesian element, especially in the north and the south of Uvea, which according to tradition was populated in those areas by immigrants from Uvea (Wallis island), about 1,000 miles to the north-east.

In physical character the people are taller than those of New Caledonia. Their hair is wavy rather than frizzly, and black, though among the men its shade is often disguised by their habit of treating it with lime until it assumes a golden colour. The skin colour is rich brown. In limb and body the Loyalty islanders are well developed, and they have broad faces, with wide nostrils and thick lips.

The Loyalty islands languages are mainly Melanesian, that of Mare in particular being closely related to the New Caledonian dialect of Houailou. But there are considerable dialectal variations. Mare and Lifu have separate dialects, and Uvea has two. Iaian, spoken in the centre of the island, is a Melanesian speech, and is used by the descendants of the inhabitants who were there before the coming of the migration from Uvea (Wallis island). Uvean, of a more Polynesian type, is based upon the language of the immigrants, and is spoken in the north and the south.

The social organization of the Loyalty islanders is very similar to that of the New Caledonian natives. There are local tribes, with chiefs who in former times had autocratic powers and an over-right to property in lands and canoes. One of a chief's privileges was the imposition of a taboo on all the coconut palms in his district, thus conserving them for a tribal feast. An important chief may still taboo the coconuts, but no feast follows; the nuts are made into copra and the money is claimed by the chief for himself. (As in other islands, the opening up of new markets and the introduction of money has tended to alter the balance of economic forces.) On Lifu all turtles caught used to be the perquisite of important chiefs, and on Uvea all large fish were in the same category. On Lifu and Mare, though not on Uvea, more elaborate forms of speech—a kind of 'court language'—are used to chiefs. In former times polygamy was a recognized institution for chiefs.

Before the coming of Christianity the people lived in small groups of wooden grass-thatched houses scattered through the plantations. Now they have been gathered together into villages, with the church as the central feature, and the houses are mostly of stone or lath and

plaster. In former times all adolescent boys and unmarried young men of a community lived together in a club-house, larger and better built than other houses; this was barred to women, and served also as a meeting place for men and as an embryonic village council hall.

Warfare between different districts was formerly common, but was conducted according to recognized rules, which included abstinence from any interference with women and children. Cannibalism was practised on the bodies of the slain, and also at other times. The people of Lifu assert that they were driven to cannibalism by famine; those of Uvea state that they learnt the practice from the natives of New Caledonia.

In former times the religion of the natives of the Loyalty islands was similar to that of the natives of New Caledonia. Now all the people are Christian. British Protestant missionaries were established there at an early date, before the French annexation, and on the arrival of Roman Catholic missionaries after 1864 there was considerable friction between their converts. As late as 1880 hostility between them was acute, a number of persons having been killed in an interdenominational fight. Relations are now friendly. On Mare the Protestant mission is situated at Ro, in the north, and the Catholic mission at La Roche, more to the east. On Lifu a Protestant mission station is at Chépénéhé and a Catholic one at Nathalo. There are also several other mission stations. On Uvea the Catholic mission is at St Joseph; other stations are at Faiaoué and Muli.

Administration

Administration is in the hands of a Resident, responsible to the French High Commissioner for the Pacific, at Noumea. He is also a justice of the peace with extended jurisdiction, and is normally a member of the French colonial medical service. His headquarters are at Chépénéhé, on Lifu. On Uvea and Mare some official duties are commonly performed by a resident medical officer, as *délégué de l'administration*. Education is undertaken by mission schools.

The health of Europeans in the group is good, but yaws, tuberculosis, leucoderma and leprosy exist among the native population, and epidemic diseases have been introduced at various times. The increased consumption of European foods in late years is reported to have given rise to a greater incidence of dental caries. Leprosy in particular has been a problem. In 1929 there were about 100 lepers known on Mare, and 192 were segregated in Lifu, with from 20 to 30 cases in the early stage of infection discovered each year. Since

then more active measures of control and treatment have been undertaken (p. 462). The Resident at Chépénéhé, on Lifu, is a doctor and recently another medical man has begun work on Mare, where dispensaries and leprosy asylums have been established, and maternity and pre-natal services put into operation.

Economics

The main economic pursuits of the people are agriculture and fishing. Yam, taro, sweet potato and gourd are cultivated, and in recent times manioc, cabbage and other vegetables have been introduced. In cultivation a rough system of rotation of soils is observed, the proper time that the land has remained fallow being judged by the height of the brushwood upon it. The soil covering is too scanty to allow the use of the plough, and the cultivating implement is still the pointed wooden digging stick. The soil is broken up by the men, but the bulk of the agricultural work is done by the women. Apart from the cultivation of food crops, a considerable amount of copra is produced—the production for Uvea alone was given as 1,250 tons in 1934. Cotton-growing developed rapidly for some years, but as a result of the low level of prices during the depression the cotton plantations were totally abandoned by 1932, and it is doubtful if they have gone back into production in more recent years. (Details of exports from the group cannot be given, as they are included in the totals from New Caledonia.) A little rubber is grown, but sandalwood, formerly a principal export, is now practically exhausted.

The men of the Loyalty islands are expert fishermen, using a variety of gear, including seine nets, spears, traps and hooks and lines. The nets were formerly made in several villages which specialized in this work, but for a time after European contact the craft of netting almost died out. It was then revived in the Protestant schools, though the output does not appear to meet the demand. The natives prefer their own nets to those of European manufacture on the ground that the former are more durable. Canoes of two types, with single and with double outrigger, were formerly built from local hardwoods; both types were sailed. But now boats of European style are in sole use.

The demand by Europeans in New Caledonia for labour on plantations and on sailing craft has attracted the men of the Loyalty islands, and they are good workers. Nearly every young man spends some years working for wages, and the cash received for this invisible

export forms a considerable addition to the income of the group. It is expended on a variety of European foods, utensils and clothing.

Communications

The Loyalty islands service provides a trading steamer every 35 days to the group, but considerable transport is effected by schooners and launches within the group. The island of Uvea suffered the loss of most of its craft in a cyclone in 1939. On each main island there is a network of roads in fair condition, but motor vehicles are few, and most communication is on horseback or on foot.

There has been a W/T station at Oué, on Lifu, since 1930; in 1939 a small station was set up at Tadine on Mare, and in 1940 another was installed at Faiaoué in Uvea.

OTHER DEPENDENCIES

WALPOLE ISLAND

Walpole island lies in lat. $22^{\circ} 38'$ S, long. $168^{\circ} 55'$ E, about 154 miles south-east of Noumea. It was discovered in 1794 by Captain Butler of the ship *Walpole*.

The island is about $2\frac{1}{4}$ miles long by less than 1 mile wide, and has an area of about 310 acres. It is composed of raised coral limestone, and has the appearance of a flat, narrow table, with vertical walls about 230 ft. high. There is no barrier reef, but a fringing reef extends as a flat platform at the foot of the cliffs. There are no tall trees, but there is a fairly dense scrub. The native fauna is limited, but includes fruit bats, birds such as gannets, bosun birds and pigeons, and at least one kind of wader. Lizards are numerous, and cockroaches, centipedes and several kinds of butterflies occur. Introduced animals include goats, pigs and cattle—for food; and mules—for traction.

The limestone of the island is impregnated and covered with rich deposits of phosphate to an average depth of about 30 in.; it reaches as much as 20 ft. in some depressions. The phosphate is mainly of a loose earthy 'alluvial' type, and is of chocolate colour. The island has been leased by the Austral Guano Company, of Melbourne, which normally maintains on it a staff of several Europeans and 100 to 150 natives, Javanese and Tonkinese. Production of phosphate in a normal year has been estimated to be about 10,000 tons, but this is hardly borne out by the export figures. Analysis has shown

about 60 per cent. of tricalcic phosphate in the samples. The material is usually sun-dried and crushed to powder in a mill; in wet periods steam vacuum driers are used. After treatment it is bagged and sent down a chute to lighters for loading.

There is no anchorage at Walpole island, but ships tie up to strong moorings (which, however, are unreliable in south-west winds) in Walpole bay at the south end of the island. There is ample depth of water in the bay, about 220 yd. from a small landing stage which is the only accessible place for going ashore.

HUON ISLANDS

The Huon islands comprise 4 islets among the D'Entrecasteaux reefs, about 65 miles north-west of New Caledonia. These reefs form two separate lagoons, both accessible to ships. The southerly one, known locally as Lagon de L'Ile Surprise, is roughly oval and encloses a very large area (estimated at about 300 sq. miles). On the west side are 3 practicable passes, and 3 of the islets: Surprise, Fabre and Le Leizour. Surprise island stands on the reef at the south entrance to the lagoon; it is nearly round, about 600 yd. across and 6 or 7 ft. above sea level. Fabre island is about 1,200 yd. long by about 600 yd. wide, and is 6-10 ft. above the reef. Le Leizour island is about 1,400 yd. long and half that width, with gently sloping sandy beaches about 25 yd. wide. The northern lagoon, which is pear-shaped, is about 16 miles long north and south, and 11 miles wide at the south end. On the encircling reef is Huon island (Huon du Nord), a sandy islet about $\frac{1}{2}$ mile long.

The only safe anchorage in the group during bad weather is off Huon island, in 9-14 fathoms, on a sandy bottom, but there is normally good anchorage off Surprise island in 17-19 fathoms.

All the islets, which have a total area of about 160 acres, are somewhat barren, though Fabre island is said to be wooded. The temperature varies broadly between 50 and 70° F., and the average annual rainfall is in the region of 30 in. There is no surface water, and wells dug on Surprise island have given no drinkable water. Little is known of the fauna of the islands, but turtles are stated to be abundant, and also a species of petrel—the 'mutton bird', which in Australia and New Zealand is used as food.

The economic importance of the islands lies in their phosphate, especially from Surprise island and Fabre island. The group is leased by the Austral Guano Company, and the deposits have been

worked in the past by 50 to 70 Loyalty islanders under the supervision of two French overseers. The deposits on Surprise island alone are now worked. In a normal year the group is stated to have produced about 6,000 tons of phosphate. A mole projecting into deep water off the north-east side of Le Leizour island was built many years ago for loading phosphate. There is no indigenous population.

CHESTERFIELD ISLANDS

The Chesterfield islands consist of 11 coral islets lying about 285 miles west of the Huon islands. The islets vary in size from $\frac{1}{2}$ mile to $1\frac{1}{2}$ miles in length and have a total area of about 250 acres. The principal ones are: Chesterfield, Longue, Avon, Banda, Bampton and Sandy. They are low-lying and wooded. There is no indigenous population.

The islands contain very rich deposits of phosphate—estimated at not less than 750,000 tons—and are leased by the Austral Guano Company. No figures of production are available.

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For maps, see Appendix I.

Chapter XIII

GENERAL REVIEW OF THE NEW HEBRIDES

Physical Geography: History: Peoples: Administration: Social Services:
Economics: Ports and Settlements: Communications

The New Hebrides, including the Banks and Torres islands, lie between lat. 13 and 21° S and long. 166 and 171° E. They are thus north-east of New Caledonia and south-east of the Solomon islands. The islands are generally mountainous. The climate is hot and humid. Much of the land surface is covered by dense tropical forest.

The New Hebrides proper comprise twelve major islands, eighteen lesser islands, and between thirty and forty small islands and islets distributed round their coasts. They are dispersed in the form of a Y, of which the southern islands form the tail. The Banks group, consisting of two major and six smaller islands, forms a northward extension of the eastern arm; and the five islands of the Torres group lie further to the north-west (Fig. 165). The area of the principal islands is as follows:

Espiritu Santo	1,500 sq. miles	Omba	105 sq. miles
Malekula	450 " "	Epi	100 " "
Eromanga	330 " "	Maewo	90 " "
Efate	300 " "	Vanua Lava	85 " "
Ambrim	160 " "	Gaua	85 " "
Tana	150 " "	Malo	70 " "
Raga	125 " "	Ancityum	40 " "

The New Hebrides are ruled jointly by Britain and France as a condominium. The principal administrative officers are the High Commissioners of the two Powers, who normally reside in Suva and Noumea respectively. They are represented in the group by Resident Commissioners.

PHYSICAL GEOGRAPHY

STRUCTURE

The geological history of the New Hebrides, like that of the other continental archipelagos of the Western Pacific, is one of considerable complexity. The group owes its existence primarily to the development during Miocene times of a fold-ridge, apparently continuous with that passing round the north of New Guinea, through Sumatra, to the Himalayas and southern Europe. This upfold would appear



Fig. 165. The New Hebrides
Based on G.S.G.S. map no. 4298 (on a conical projection).

to have defined the line of the present western islands, in which extensive outcrops of Miocene strata occur. With faulting there was an extrusion of basalt and andesite lavas and subsidence of the sea floor to the east. Thus, both arms of the archipelago were built up, and the whole was cut off by deep water from Fiji to the eastward. Probably at a later period there occurred the extensive trough-faulting, crossing the original fold, which divided the two ridges into the present chain of islands. Meanwhile, submarine tuffaceous beds were accumulating above the folded Miocene series; and, upon them in turn as they approached the surface, coral limestones began to form. The region as a whole has since been subject to intermittent elevation, so that both these formations of submarine origin are now found at considerable heights above sea level.

The main islands can be considered, from the point of view of structure, in three groups: (i) islands (namely Espiritu Santo and Malekula) in which extensive outcrops of Miocene volcanic and sedimentary rocks occur; (ii) the remaining volcanic islands, composed of more recently extruded materials; and (iii) the small islands formed almost entirely of coral limestone.

Both Espiritu Santo and Malekula contain regions of two widely different rock types and landscapes. The eastern part and the southern coastal area of Espiritu Santo, and the northern plateau and parts of the coastal lowlands of Malekula, are covered with thick beds of coral limestone. In these regions the islands are very similar to many others in the archipelago. But in the mountains of western Espiritu Santo and the south and centre of Malekula, where the Miocene outcrops occur, the country possesses many characteristics not found elsewhere in the group.

In the main range of Espiritu Santo, running nearly the whole length of the island, roughly parallel with the west coast, the oldest rocks found are of early Miocene age. They are thick beds of andesite agglomerates and tuffs. Above them occur limestones of later Miocene age. Above these again are extensive beds of more recent volcanic lavas and agglomerates, predominantly andesitic though with considerable quantities of more basic materials. In some parts these beds reach a total thickness of over 5,000 ft. (Fig. 166). They are much faulted and the landscapes of the mountain areas are characterized by high, sharp peaks—in mount Tabwemasana the range reaches 6,195 ft.—and by precipitous drops into deep canyons, through which the rivers find their way to the west coast and to the lower lands of the south and east (Fig. 188).

By contrast, Malekula was not affected by the later volcanic eruptions which formed the mountains of Espiritu Santo; and the island appears in the main to be built up of Miocene marine tuffs and limestones, with andesite intrusions. During the long period in which these rocks have been exposed to tropical denudation they have been greatly eroded, and thick beds of alluvium have been deposited in the valleys. Thus the landscapes of Malekula are characterized by dome-shaped hills of no great altitude—mount Penot, the highest peak, reaches only 2,925 ft.—and by broad flat valleys of high fertility (Fig. 186).

Among the other islands wholly or partly of volcanic formation, geological study, so far as it has gone, has tended to show a gradual

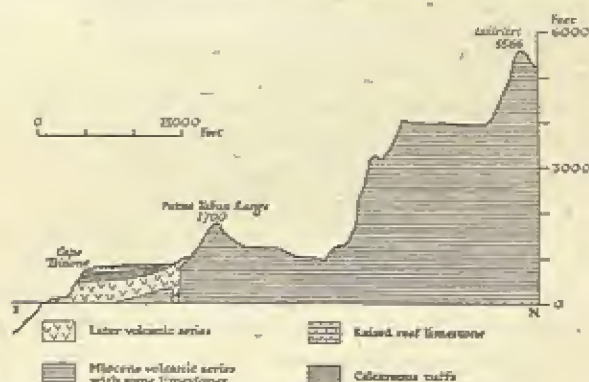


Fig. 166. Section from cape Tsinone to Lailiiri, south-west Espiritu Santo. The section is very generalized. For a map of the area see Fig. 188. Based on D. Mawson, 'The Geology of the New Hebrides', *Proceedings of the Linnean Society of New South Wales*, vol. xxx, plate xxv (Sydney, 1905-06).

building up during successive periods of eruption extending from early post-Miocene until recent times. The island of Epi (Fig. 190), for example, well illustrates this fact. To the west of a line joining Diamond and Smaile bays the mountains, mainly of scoriaceous tuffs, are deeply eroded. To the east the formations are much younger, and several volcanic cones, remarkably well preserved, may be seen. In three islands, Tana, Lopevi and Ambrim, there are active volcanoes; and in a number of others hot springs are found (pp. 516-18).

The volcanic rocks of the New Hebrides are of varied composition, including basalts, andesites and dacites. In some islands, such as Epi, Efate and Tongoa, two or all three of these types occur in

close proximity to one another. In others, one or other type is largely predominant. Thus, Raga, Maewo and Gaua, all in the north, appear to be formed mainly of basalts, and Tana and Eromanga, in the south, of andesites. This difference, indicating primarily variation in silica content, is of considerable importance owing to its control of the composition of the soils of the islands.

As has been mentioned, in many areas the volcanic rocks are overlain by coral limestone, where successive uplifts of the land have raised former fringing reefs above sea level. This elevation still continues. Its most striking recent manifestation has been in Tana, where Port Resolution, formerly the principal anchorage, has been

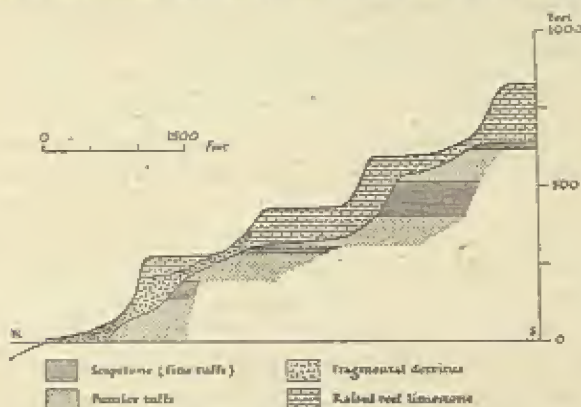


Fig. 167. Section at Steep gully, Havannah harbour, Efate

The section is very generalized. Based on D. Mawson, 'The Geology of the New Hebrides', *Proceedings of the Linnean Society of New South Wales*, vol. xxx, plate xxiv (Sydney, 1903-06).

rendered useless within the last seventy years through the shallowing of the harbour.

In other parts of the group former reef material has been raised in stages to heights of over 2,000 ft. These successive uplifts have given the land a striking terraced formation. Among the most important coral areas are those in Espiritu Santo and Malekula. Others occur in the north of Maewo and Raga, in the west of Epi, in Malo and Aore, at several points round the coasts of Tana and Eromanga (Fig. 198) and in many other parts of the group. The profiles of the Torres islands seem to show that they are almost entirely encrusted with coral limestone. The best-known example of this formation is, however, probably provided by Efate (Figs. 167, 185). Over the

greater part of this island the limestone crust is so complete that the casual observer would be led to believe that the island itself is of purely coral formation. In fact, however, this crust is apparently seldom more than 50 ft. thick. The highest and oldest terraces form the flat hilltops in the northern part of the island, at heights of 2,000 ft. and over; and a succession of increasingly newer terraces, marking the sea level at different periods, occur down to the beach. Study of the lower terraces shows that each main terrace was raised above the next one by a series of minor elevations.

The many small, flat islets off the coasts of the major islands are similarly formed of a combination of volcanic and coralliferous material. Some, such as Rano and Atchin, off the north-east coast of Malekula, are primarily volcanic with only a thin coral crust, while others, as for example Lelepa and Eradaka, off the west coast of Efate, appear to be built up very largely of coral limestone. The only island of any importance of wholly coral limestone formation is Rowa, in the Banks islands, the sole atoll in the group.

Vulcanism

The active volcanoes—in Ambrim, Tana and Lopevi—and the other manifestations of present volcanic activity require more detailed mention.

The island of Ambrim (Fig. 191), the scene of by far the most violent eruptions of recent times, represents the truncated cone of an ancient volcano of great size. The floor of the old crater is now thickly covered with ash from the outbursts of daughter cones formed within it. Two of these latter, each about a mile in diameter, are still active. They are situated on the flanks of the high peaks of mounts Benbow and Marum. There are also a number of parasitic cones distributed round the island; several of them have been active within the last fifty or sixty years.

The most violent of recent eruptions occurred in October 1894, December 1913, June-July 1929 and March-April 1937. On these occasions great quantities of stones and lava were thrown out from the craters, and columns of dark smoke ascended to heights of over 20,000 ft. Vents also opened in the hillsides of the island, from which lava flowed down to the sea; and parasitic cones were formed both on the island and off the coast. This activity has been almost entirely localized during this period in the south-western part of the island. The 1913 eruption was accompanied by great changes in the level of the land between Craig cove and Krong point. In some places the

coastal region was greatly raised, so that the coastline shifted appreciably. Elsewhere there was almost equally great subsidence.

The inhabitants, both European and native, have suffered severely upon these occasions. The situation of natives inland, where the stream beds became torrents of molten lava and the forest took fire, was appalling. But on the coast also there has been much disruption. In 1913 the site of the Presbyterian mission station and hospital sank beneath sea level; and in 1929 the new station, which had been built to replace the old, was itself overwhelmed by a lava flow. Trading stations and coastal villages have suffered similarly.

Volcanic activity in the island of Lopevi, between Ambrim and Epi, has been much less vigorous. Lopevi is a small island, consisting almost entirely of a volcanic cone rising evenly to a height of 4,755 ft. It is reported to have been very active in 1863-4. Since that time there have been several further eruptions. The most recent was in November 1939, when a vent appeared in the side facing Epi, from which streams of lava flowed down to the sea.

The only other volcano to have been active in historic times is that of Yasur, in Tana. This is situated about 3 miles from the head of Port Resolution, on the slopes of the main range. It is a fairly regular cone of volcanic ash and scoria. The rim reaches its highest point (about 1,300 ft.) on the north-west side; on the east it has been broken down by a former eruption. It is continually active. The loud reports which mark each outburst sometimes occur at intervals of only a few minutes over a period of a day or two; at other times it is practically quiescent for two or three days. From the five mouths within the crater large quantities of incandescent ash are extruded, often in the form of fine filaments of glass and of light woolly flakes which settle on the trees and the roofs of houses to leeward over a distance of several miles. Apart from this fall of ash (Plate 76), and the prevalence of minor earthquakes accompanying this volcanic activity, Yasur causes the inhabitants of the island no inconvenience; and, in fact, the cone can safely be ascended on the windward side during eruptions.

There are other indications of volcanic activity at many places in the archipelago. On Vanua Lava (Fig. 195), in the Banks islands, there are a number of boiling springs, with water charged with sulphuric acid. On the neighbouring island of Gaua (Fig. 194) there are also boiling springs. There are other hot springs on the islands of Raga, Ambrim, Epi, Efate and Tana, and escapes of gas on Omba

and Tongoa. Most of the earthquakes which frequently shake the islands are also of volcanic origin.

All this volcanic activity is localized along a line of fractures running through the New Hebrides from north-west to south-east. The islands of Espiritu Santo and Malekula lie to the west of it, while Maewo and most of Raga lie to the east. It continues in a northerly direction to include the active volcano of Tinakula, in the

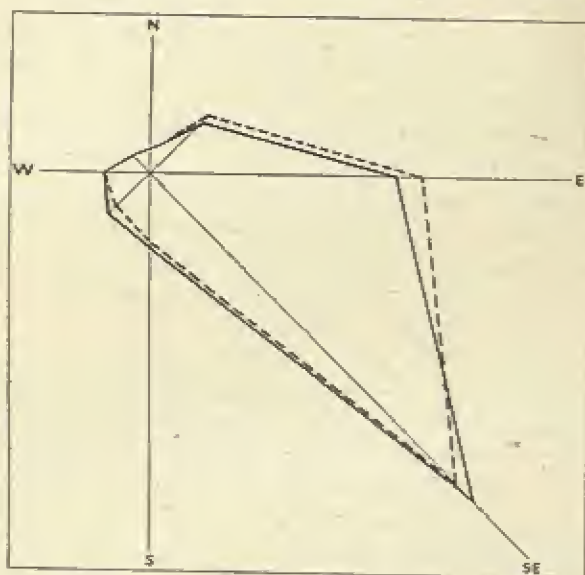


Fig. 168. Winds at Vila

For general explanation see Fig. 37. The pecked line shows winds at 0900 hr.; the solid, those at 1500 hr. Based on an official source.

Santa Cruz islands (p. 693), and southwards to include Hunter island (p. 604), where there are still signs of volcanic activity.

COASTS AND ANCHORAGES

The most characteristic feature of the coasts of the New Hebrides is the small development of coral reefs. This is to be attributed, partly at least, to the steep submarine slopes from the shores of the islands. In contrast to the broad coral terraces existing above sea level on so many of the islands, the present fringing reefs have seldom been able to extend to any great distance from the shore. For a similar reason

barrier reefs, so well developed in the neighbouring areas of New Caledonia and Fiji, are generally absent.

The coastline proper varies greatly in character from island to island (Plates 76, 79-82; for a detailed description see Chapter XIV). Espiritu Santo, Malekula and Efate, and to a less extent Vanua Lava and Aneityum, are all moderately heavily indented and protected by outlying islands. In other islands the bays are generally shallower, and there are numerous stretches of coast almost without indentation. Beaches are sometimes of fine sand, but often of shingle or rough broken coral (Plate 81).

Anchorage is numerous in most islands, though from the nature of the coast comparatively few of them offer protection in all weathers.

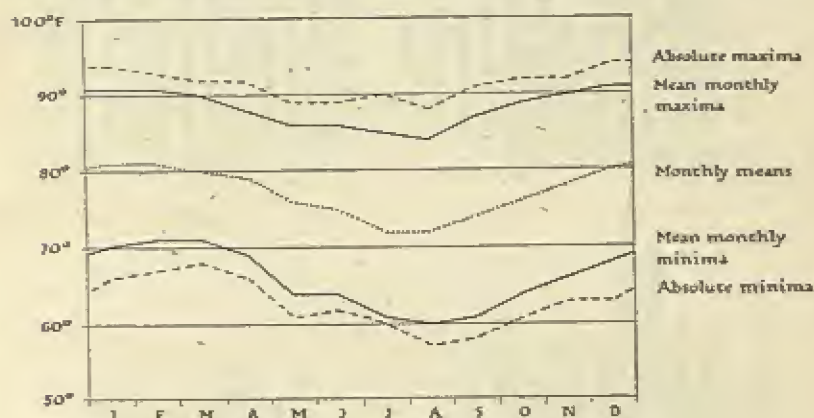


Fig. 169. Monthly temperatures, Vila

From 7-10 years' observations. Based on an official source.

Those in the islands of the eastern chain of the New Hebrides proper, between Epi and Maewo, are particularly exposed, though several of the bays of Epi and Ambrim are spacious, with adequate depths of water for a fleet of large ships. The best anchorages in the group are on the east and south coasts of Espiritu Santo and Malekula and the north and west coasts of Efate. Among the considerable number of anchorages in these areas, those of Segond channel (Fig. 184) in Espiritu Santo, Port Sandwich, a long narrow harbour in the south-east of Malekula, and Havannah and Vila harbours (Fig. 183) in Efate, are the most noteworthy; all are completely protected and provide anchorage for a considerable number of ships.

CLIMATE

The New Hebrides lie in the region of the south-east trades. These winds predominate throughout the year (Fig. 168). They give way frequently, however, to short calms, often followed by winds from points between north and east. These north-easterlies tend to bring

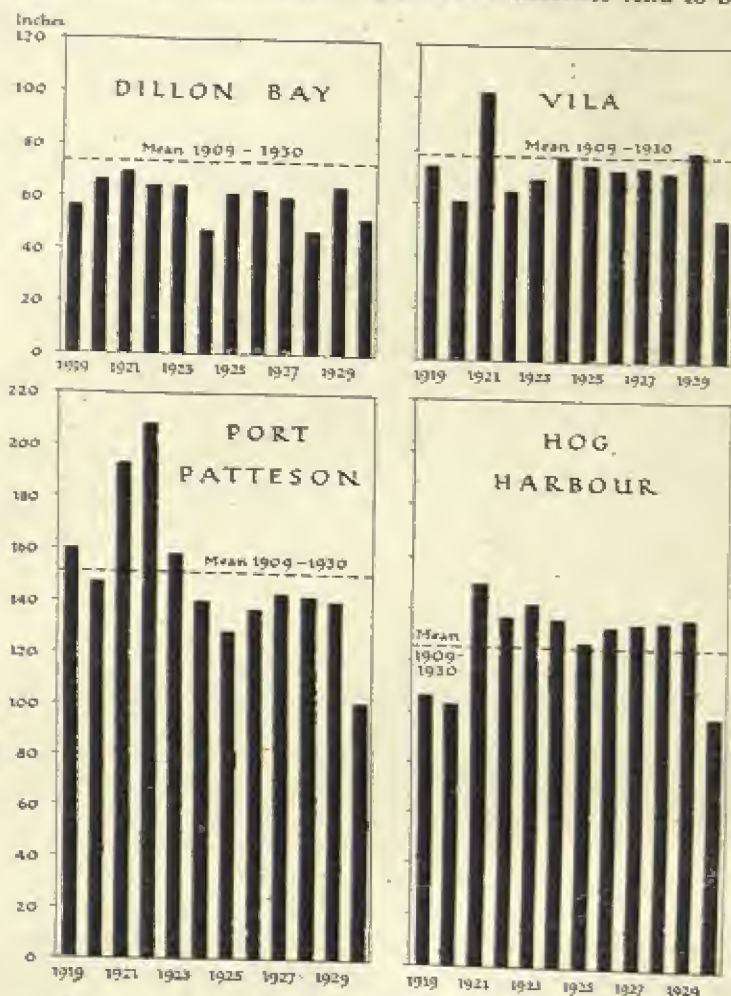


Fig. 170. Annual rainfall at four stations in the New Hebrides

The mean for 1909-30 for Dillon bay shows that great variation in rainfall may occur not only between year and year but between one period of ten or more years and another similar period. Based on Colonial Office *Annual Report* for 1909-30 (London).

rain, and are most common between the beginning of November and the middle of April. During the first quarter of the year the northern part of the group, roughly as far south as Epi, occasionally experiences hurricanes. In recent years these cyclones have severely damaged plantations on several islands—notably Epi, Malekula and Espiritu Santo.

Temperature and rainfall in the Banks and Torres islands and the

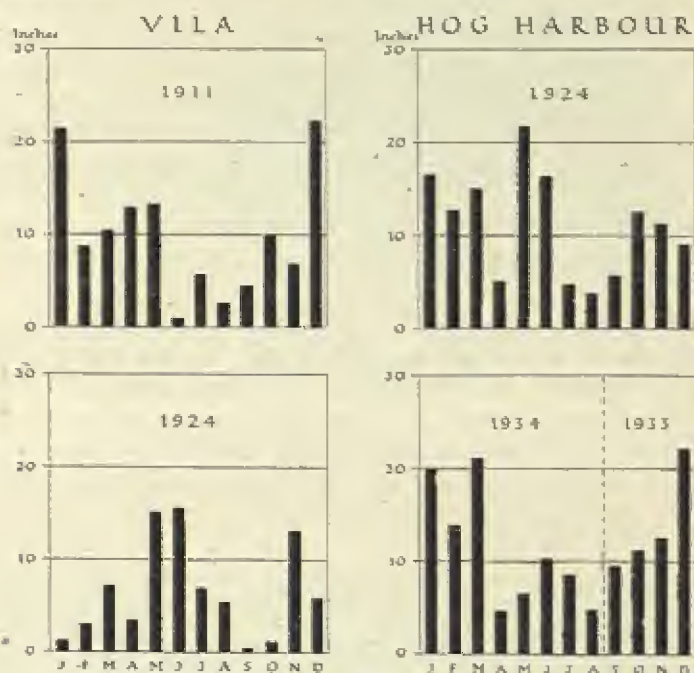


Fig. 171. Monthly rainfall, Vila and Hog harbour

Based on: (1) F. Speiser, *Ethnographische Materialien aus den Neuen Hebriden und den Banks Inseln*, p. 31 (Berlin, 1923); (2) Colonial Office *Annual Report* for 1924 (London); (3) J. R. Baker and others, 'The Seasons in a Tropical Rain-Forest (New Hebrides)', *Journal of the Linnean Society of London, Zoology*, vol. XXXIX, p. 463 (London, 1934-6).

northern half of the New Hebrides proper resemble those of the Solomon islands and, to a less extent, of Fiji. In Efate and the islands farther south conditions are less tropical; there is considerably greater seasonal variation in temperature, and the rainfall is lighter. Observation over three years at Hog harbour, in Espiritu Santo, showed a variation in the monthly means of temperature of only 4° F., between approximately 81° for the hottest months (December

to April) and 77° for the coolest (July). At Vila in Efate, on the other hand, there is a range of about 9° , between 81° in January and February and 72° in July and August (Fig. 169). Records kept many years ago by missionaries on Futuna, in the far south of the group, closely resemble those for Vila.

Rainfall varies in accordance with three main factors. The primary difference is between the extreme wetness of the northern islands and the more moderate conditions in the south. Precipitation is also heavier on the higher islands than on the lower and upon the windward sides of islands than upon the leeward. The combined effect of the first and last of these factors is shown in Fig. 170—Port Patteson (in Vanua Lava) and Hog harbour are both on the east coast of islands in the north of the group; Dillon bay (in Eromanga) and Vila are both on the west of islands in the south. In general, it appears that in both north and south there is least rain in the period June to October; but the variations from year to year are considerable (Fig. 171).

These figures all relate to climate at sea level. There is little material available regarding conditions in the mountains. In the months of October and November 1933 daytime temperatures in the Tabwemasana region of Espiritu Santo were found to be about 10° F. lower than those at Hog harbour at the same time. Heavy rainfall was experienced on most days from about 10 a.m. until nightfall, with frequently clear starlit nights.

VEGETATION

The vegetation of the New Hebrides has been little studied; but in general it can be said to resemble that of Malaya, New Guinea and the Solomon islands, and it has some affinities with that of New Caledonia. The number of species recorded is 569, of which 36 per cent. are endemic. Most of the group is covered with forest from the shoreline to the summits of the highest mountains. In the larger islands this is very dense, with a matted undergrowth.

Strand trees (Plate 76) include *Barringtonia* and *Calophyllum inophyllum*, both of which prefer the more sheltered stretches of coast, where they grow overhanging the sea; lofty casuarina, common in the more exposed positions; *Terminalia catappa*; *Tournefortia*; and *Cordia subcordata*. On the south and east coasts of Malekula and in parts of Efate there are stretches of mangroves and other swamp vegetation (Plate 77). The banks of rivers and lagoons commonly



Plate 76. Strand trees at Whitesands, Tana
In the foreground, with rosettes of narrow elliptical leaves, is
a large *Tournefortia*.



Plate 77. Wet forest at Tesman bay, Malekula
This vegetation is typical of that on many parts of the east coast of Malekula.



Plate 78. Land near Yasur, eastern Tanna

The ground and the vegetation are largely covered by ash thrown out by Yasur volcano.



Plate 79. Lolowai bay, Omba

The building on the headland is the old Melanesian Mission station. This has now been replaced by more extensive buildings, mainly situated on the slopes round the inlet behind it.

support a profuse growth, with several species of convolvulus, and in many places there are extensive beds of reeds.

The forest of the northern part of the group is typical tropical rain forest. It includes the giant banyan, and in the mountains of Espiritu Santo the kauri pine (*Agathis obtusa*) also attains great size. But in general, owing to the poorness of the soil, the trees are rather small—most commonly between 30 and 40 ft. high, with trunks about 8 in. in diameter. Trees said to be common in many areas include the Tahitian chestnut (*Inocarpus edulis*) and several kinds of figs. The latter include the species *Ficus copiosa*, which sprouts dense clusters of marble-like fruit directly from its trunk. In former times a sandalwood (*Santalum austro-caledonicum*) was abundant in many islands, but it has been much reduced by cutting. Among the most notable trees of the mountain areas is the flame tree (*Metrosideros collina*), whose bright red stamens make a brilliant display. The most unpopular tree with travellers is the unpleasant 'nettle tree', which can be recognized by the red midribs of its large dark green leaves. Other trees reported from Hog harbour, which has several times been the headquarters of scientific expeditions, include a rose-apple (*Eugenia*), several species of *Hernandia*, *Spondias dulcis* (a tree with large yellow edible fruit), *Castanospermum australe* (a larger tree with bright red flowers), and *Garuga floribunda* (which is remarkable for losing all its leaves in September every year). In many areas the general sombreness of the forest is lightened by occasional stands of bamboo.

The branches of the larger trees support a great variety of ferns, growing epiphytically; and there is a vigorous growth of creepers. At higher altitudes there is an abundance of orchids, both epiphytic and terrestrial. The undergrowth consists mainly of shrubs up to 5 or 6 ft. in height. There are also a number of shrubs with strikingly coloured leaves. These include the coleus, which is common in many parts of the forest, crotons and dracenas. The growth of low herbs is very scanty in many parts of the forest, apparently owing to the lack of direct sunlight.

Apart from villages, cultivations, and abandoned clearings, the only breaks in the forest are patches of grassland. In the southern islands, particularly Eromanga, the grass is of a type suitable for the grazing of stock. In the north, notably Malekula, where the limestone terraces of the northern end of the island are free of forest, the cover consists of the coarse cane grass *Miscanthus japonicus*. This grows in tussocks, which reach 10 or 12 ft. in

height and give shelter to a dense growth of low and trailing plants.

Like other Pacific islanders, the people of the New Hebrides have an extensive knowledge of the plants of their district. They are skilful gardeners. They time their horticultural operations in many cases by botanical signs. Thus the natives of Hog harbour plant yams when flowers appear on the *Erythrina indica*. Other plants cultivated by the natives include coconut, taro, ginger, orange, banana, papaya, and breadfruit; and they are fond of adorning their villages and the tracks surrounding them with ornamental plants such as coleus, crotons and dracænas. The most important plants introduced by Europeans are cotton, cocoa and coffee.

FAUNA

The fauna of the New Hebrides is less rich than that of New Guinea or the Solomon islands, but richer than that of most of the island groups farther east. The expanse of sea separating the group from the Solomon islands, its nearest neighbour, has not been sufficient to prevent the arrival of bats and many genera of birds, of some insects and rats, and of an occasional crocodile. But other types such as the cuscus, the one marsupial which has penetrated as far into the Pacific as the Solomon islands, are absent.

Apart from those introduced in European times, the only mammals are bats, rats and pigs. Five species of fruit bats have been identified, one belonging to the unusual tailed genus *Notopterus* and the other four being Pteropidæ. The commonest of these is *Pteropus geddiei*, a large black bat with a bright yellow mantle. This species was first observed in Aneityum, where it was eaten by the people and its fur spun into cordage. It is found throughout the New Hebrides and also occurs in New Caledonia, the Santa Cruz islands, and several other parts of the Western Pacific. It can often be seen by day hanging in large colonies in banyans and other trees of the fig family. The three other species have evolved within the New Hebrides and are found only in certain parts of the group. The food of these animals consists largely of bananas, papaya and the fruit of *Ficus copiosa*, supplemented by other fruits and berries when they are in season. There are in addition two insectivorous bats. The commonest of these is a small black bat found also in New Caledonia, the Loyalty islands, and Queensland. There are two species of rats—the common black rat, a recent arrival; and the Polynesian bush rat (*Rattus exulans*).

The pig *Sus papuensis* appears to have been brought to the islands by the present native inhabitants. Many pigs are domesticated, but others live wild in the bush. In four of the Banks islands and several of the northern islands of the main group—including Espiritu Santo and Ambrim—there occur pigs possessing both male and female reproductive organs, but incompletely developed so that they cannot breed. In other parts of the world, vertebrates occasionally produce hermaphrodite offspring, but among the pigs in parts of the New Hebrides this abnormality is common. In the district of Sakau, in north-eastern Espiritu Santo, for example, it has been estimated that there are between 10 and 20 'intersexes' to every 100 normal males. These animals are highly valued by the native peoples. As with ordinary male pigs, they knock out the upper canines, so that the lower can grow indefinitely. This growth takes place circularly, with the result that eventually the tip of the tusk often re-enters the jaw near its own root (Plate 84). Thus deformed, the pigs are one of the primary forms of wealth in native communities (p. 545).

The only other mammals are dogs and cats, sheep (mainly on Eromanga), and other domesticated animals such as horses.

The avifauna of the New Hebrides is essentially Australian. Certain groups of birds very characteristic of the mainland—such as lyre-birds and bower-birds—are absent; and the islands possess three types—thrushes, weaver-birds and starlings—which Australia lacks. But a large number of genera are common to both. The majority of species found in the islands, however, are known nowhere else, for the long period of isolation and the peculiarities of climate and environment have produced minor changes in structure besides much greater ones in habits and songs.

The majority of birds in the larger islands inhabit the jungle. Among the most numerous of these are various species of pigeons, the brush-tongued parrot (*Trichoglossus haematodus*), the moustached honey-eater, the chestnut cuckoo, the white owl (of the same species as that found in Great Britain), and several species of thick-heads. Round the coasts white-eyes (*Zosterops vatesensis*) may often be seen congregated in great numbers for the night in the large strand trees. In the higher mountain areas of Espiritu Santo and Malekula the orange-and-green honey parrot and the little *Cichlornis* have been found in large numbers. The New Hebrides have many varieties of birds inhabiting swamps and the vicinities of rivers. These include blue-and-red parrot-finches, a swamp hen, several species of waders, ducks, and, in some areas, a very attractive small black-throated

grebe. Among the birds which have deserted the jungle for gardens and plantations are the diminutive flaming-cardinal honey-eaters (which are fond of hibiscus), the black-and-white swiftlets (closely related to the edible-nest swiftlets of the Orient), fantails, silver-eyes, the blue-and-rufous swallows, and some of the honey parrots. Of birds of prey there are hawks and harriers. One of the most interesting birds found in the islands is the golden plover, which arrives every August from Siberia and departs again on its annual migration six months later.

Fourteen species of lizards occur in the New Hebrides, all belonging to the families of geckos and skinks. Two of these are probably more numerous than any other vertebrates; they are seen continually scuttling across paths and gardens. Only one of the fourteen species is confined to the New Hebrides. There are two species of snakes, both non-poisonous. Crocodiles are seen occasionally in the northern part of the group.

The marine fauna of the islands has not been extensively studied, but both the rivers and coastal waters appear to be well stocked with fish. In some rivers prawns and eels are abundant. Outside the protecting reefs sea-bats (giant rays) are found. These have been known to upset canoes. Sharks and giant rock cod also abound.

Invertebrates include the large robber crab, which is said by the natives to eat snakes and is reputed to be able to break open coconuts. There are several gigantic insects. One, a beetle, has been found sometimes to weigh more than 10 grams; the stick-insect attains about 7 in. in length. The most dangerous, however, is *Anopheles punctulatus*, a mosquito which carries malaria and possibly filariasis. In parts of the group it is abundant; in others it is hardly ever seen.

HISTORY

Discovery

The discovery of the New Hebrides, like that of the Solomon islands, was made early in the history of Pacific exploration, but was only given completeness and accuracy after most other parts of the Pacific had become known. The group was first visited by the Spaniard Pedro Fernandez de Quiros in 1606, during his search for the fabulous southern continent of *Terra Australis Incognita*. Quiros approached the New Hebrides from the north-east. He passed through the Banks islands, which he described as being fertile and beautiful; he sighted the three islands of Maewo, Omba and Raga,



Plates 80-2. Coastal scenery, Banks and Torres islands

Plate 80 (top) is a view from the northern end of Toga, showing Loh on the opposite side of Dumanoir channel; to the right of Loh the coast of Tegua can be faintly discerned. Plate 81 (middle) shows the rough coral beach at Vipaka, on Loh. Plate 82 (bottom) shows Dives bay, Ureparapara; the hills form the north-western shore, and the entrance to the bay is off the photograph, to the right.



Plate 83. A Melanesian of Malekula
This man is from the south-west of the island. He
is holding a spear.

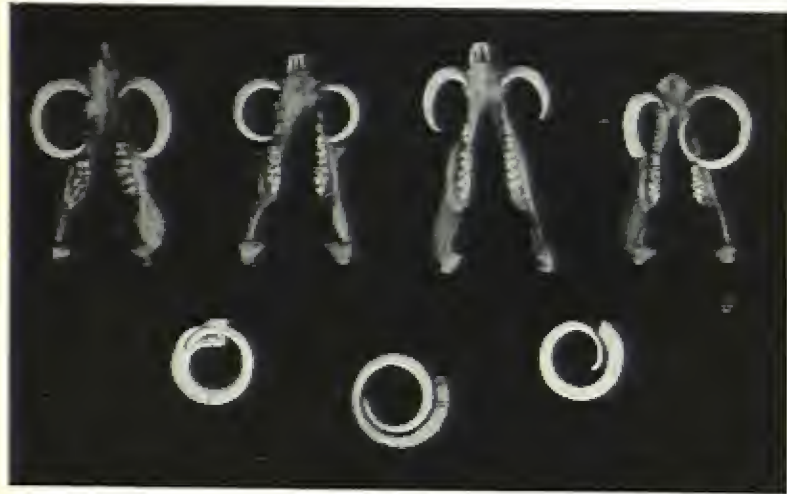


Plate 84. Deformed boars' tusks
The upper canines have been knocked out, so
that the lower have been able to grow indefinitely.

and mistook them for one extensive land; and after two days more the ships entered a great bay farther to the south-west.

This bay was named in honour of St Philip and St James, for it was on their feast day (1 May) that it was discovered. On three sides high mountains rose into the clouds, and broad rivers flowed into it from the interior. Quiros was convinced that he had reached the shores of the southern continent. He named the new land 'Austrialia del Espiritu Santo'. The journeys of reconnoitring parties further convinced him of its richness, and he determined to found there a new province for the King of Spain. A city was planned on the banks of the principal river, the Yora (named by Quiros the Jordan), and given the name of New Jerusalem. An official hierarchy was created for the new province, and crops were planted to substantiate the occupation. After three weeks of great activity, however, Quiros decided that the venture had no chance of success. The expedition sailed, leaving the group to an isolation which was unbroken for over 160 years.

The next European expedition to visit the islands was that of the Frenchman Louis Antoine de Bougainville in 1768. Bougainville entered the group to the north of Maewo, passed close to the shores of Omba, and so approached the opposite coasts of Espiritu Santo to those seen by Quiros. He recognized that he was in Quiros's group, and like him he was misled by the apparent continuity of the land. However, boat parties proved that what had seemed at first to be bays were passages between separate islands; and the ship finally passed through the strait between Espiritu Santo and Malekula into open sea to the west.

Five years later the group was visited by Cook, who surveyed most of its shores and named it the New Hebrides. Cook sighted Maewo on 16 July 1773, passed southward between it and Omba, and so reached the east coast of Malekula, where he found anchorage in Port Sandwich. From there he sailed south as far as Tana, which, since he missed Aneityum, he took to be the southernmost island of the group. Thence he sailed north again, following the western coasts as far as cape Cumberland in Espiritu Santo. He entered the bay of St Philip and St James and recognized it as the scene of Quiros's grandiose but short-lived project of colonization. Cook gave the world the first detailed account of the islands and their people; and his chart remained in use until towards the end of the nineteenth century.

Within the following twenty years several other navigators passed

through the northern part of the group—La Pérouse in 1788; Bligh in 1789, in the open boat in which he and his companions had been set adrift by the *Bounty* mutineers; Bligh again in 1792 on his second voyage; and D'Entrecasteaux in 1793. But they made only minor contributions to discovery.

The Sandalwood Trade

During the first quarter of the nineteenth century the New Hebrides were almost unvisited. Only an occasional whaler entered some of the bays. In 1825, however, the trader Peter Dillon passed through the group and learnt that there was an abundance of sandalwood on the island of Eromanga. He communicated his discovery to traders residing in Tahiti. In 1829 a minor rush to Eromanga took place. Vessels sent out from Papeete were followed by others from Honolulu; labour was recruited at Rotuma and Tongatapu; and soon several timber camps were established and labourers were at work. But before long hostilities broke out between the Polynesian labourers and the natives of Eromanga, and fever also attacked the newcomers. Before the middle of 1830 work had ceased and the last party had been withdrawn.

In 1839 a fresh attempt to develop the sandalwood of the group was begun, this time under the leadership of merchants of Sydney. The first voyages were encouraging, and within a few years the traffic had spread from Eromanga to a number of other islands. In 1845 Captain Paddon established a central depot at Ancityum staffed by Europeans. From this depot small vessels worked the neighbouring islands and to it came larger ships to carry the timber direct to China. Several other merchants had similar stations in later years, but most worked on a less ambitious scale. Frequently they would have at some central point such as Dillon bay (in Eromanga) or Port Resolution (in Tana) an agent whose job it would be to travel up and down the coast making agreements with the natives to cut loads of sandalwood in advance of the returning ship.

Many of these sandalwood agents were ruffians. Their principal articles of trade were firearms and spirits. They frequently instigated, or took part in, native wars. They sometimes sought revenge for imagined grievances in the pillaging of villages and the indiscriminate shooting of their inhabitants. After about 1860 the centre of the trade tended to shift from Eromanga to Espiritu Santo and other northern islands, so that few parts of the group escaped their attention. They began a process of social disintegration and depopulation which,

through the activities of other groups of Europeans, has continued in some islands until the present day.

The Foundation of Christian Missions

On 19 November 1839 John Williams, of the London Missionary Society, landed Samoan native teachers on Tana. On the following day he reached Eromanga, where he and a companion were killed by natives, whose only close contact with Europeans had been with sandalwood traders. The martyrdom of Williams drew the attention of British evangelicals to the New Hebrides, and it founded the missionary history of the group upon a note of sombreness which later events were to sustain; in no other part of the Pacific have so many missionaries been killed in the course of their work.

The London Missionary Society determined to continue its work. Polynesian native teachers were landed, at first on Efate and the southern islands, then as far north as Espiritu Santo. European missionaries merely visited the islands at intervals of several years on tours of inspection. The lot of the teachers was hard. Many were killed by the people among whom they had settled; many more died of fevers. The reward of their labours, in terms of conversions, was slight. But they prepared the way for the European teachers who followed them.

In 1848 John Geddie, a Presbyterian from Nova Scotia, settled with his wife on Aneityum. Other Presbyterian missionaries, from Nova Scotia, Australia and Scotland, followed him. They were prepared for hardship. They spent no time in attempting to understand native institutions and imposed upon their converts a fiercely puritanical code, such as they themselves practised. They encountered the active hostility of most of the European traders and of a large proportion of the native chiefs. They did not hesitate to ask the commanders of visiting naval vessels to bombard villages where the people had offered them insult. Gradually they made headway—at first in the southern islands of Aneityum, Tana and Futuna, and in Efate, and later farther north. Often, indeed, it was only a remnant of the former population which remained to be converted, for—along with the traders—they took influenza, measles and other European diseases to the peoples among whom they worked.

The Anglicans also had begun work in the group. In 1847 George Augustus Selwyn, Bishop of New Zealand, made the first of his missionary voyages. On this and succeeding occasions Selwyn passed through the New Hebrides, travelling on a small and completely

unarmed vessel, making friends with the natives, and persuading young men to accompany him to his training college at Auckland. His work led in 1850 to the foundation of the Melanesian Mission, whose members visited regularly the islands of the northern part of the group and established a centre on Mota, one of the Banks islands.

The Labour Traffic

By about 1865 most of the sandalwood within easy reach of the coasts had been cut down; and within three or four years the trade declined from almost its peak to negligible proportions. But another traffic, even more disruptive of native life, had risen to take its place. This was the recruitment of labour in the islands for the plantations of neighbouring territories. It was a Pacific-wide movement; but the New Hebrides were one of the earliest recruiting grounds; and they remained one of the most important.

In 1863 Robert Towns, of Sydney, formerly a pioneer in the sandalwood trade, imported natives of the New Hebrides to work on his cotton plantation near Brisbane. His example was quickly followed by other planters in Queensland, in Fiji, in New Caledonia, and later in Samoa. By 1870 probably between 3,000 and 4,000 were abroad. Three years later it was estimated that of about 2,000 adult males in the normal population of Tana at least 1,200 were at that time abroad. This was an exceptional situation, but every island in the group was already to some extent affected. In the years between 1875 and 1885 the traffic expanded. By 1890 it had passed its peak, but it continued on a reduced scale into the early years of the present century.

The recruiter's normal procedure was to send a whaleboat ashore, well armed and ready to retreat hastily in case of need. If the people who assembled on the beach seemed friendly, a party would land and open negotiations. In the earlier years an interpreter would be included in the landing party—possibly a former sandalwood agent or a native of one of the islands, such as Tana or Efate, where English was already spoken by many. Later, conversation could be carried on in pidgin nearly anywhere. The trader would offer knives, tomahawks, tobacco, or muskets in return for recruits. If the bargain were acceptable, the natives would compel the required number of men and women to return with the recruiting party. This was known as 'buying'. Alternatively the recruiter might 'steal', that is, accept voluntary recruits (if he could get them) without making a payment

to their kinsfolk. In addition various forms of 'kidnapping' were all too frequently resorted to.

The consequences to the islands of this traffic were almost without exception evil. Many of those who went abroad never returned, and of those who did only a few became useful members of native society. In their absence their houses and canoes rotted and their wives often went to live with other men. Little of the stock of goods representing their wages remained to them after their relatives and neighbours had had their pick. Some of these men became the tools of the recruiters; others became the leaders of bands which made war on any party of Europeans who came within their reach. Among the population generally, the labour traffic caused the further spread of disease, the outbreak of many native wars, and the widespread craving for spirits. It broke up the ordered pattern of native life and, at the same time, made more difficult the work of the missionaries who alone were concerned with providing a stable alternative of a Western type.

European Settlement, 1870-1905

Despite the disorderly state of the New Hebrides, they had begun by 1870 to attract European settlers. The principal object of most of these settlers was the cultivation of cotton, for which prices had been high since the outbreak of the American Civil War in 1861. Their fall in the years after 1870 diverted attention to other crops—notably bananas (which, however, were a commercial failure), coffee, maize, and later cocoa and coconuts.

Settlement was concentrated in the earlier years on Tana and Efate. From these islands it spread gradually northwards. By 1905 the European population of the group was about 640, or, excluding missionaries, a little over 500. Rather more than half resided on Efate. Other large groups, each numbering between about 40 and 80, were settled in the Segond channel-area of Espiritu Santo, at Port Sandwich (in Malekula) and on the island of Epi. In a few other islands, such as Tana and Aniwa, there were also European planters, but the majority of European residents in the outer islands were either missionaries or traders. The latter were usually engaged in business in a minor way, making a living out of the exchange of cheap European goods for native-produced coconuts and copra.

Among these settlers British subjects, mainly from the Australian colonies, had at first constituted a big majority and included nearly all the most influential men. Such, for example, were Donald

MacLeod, of Vila, reputedly the wealthiest man in the group; Ross Lewin, of Tana, a former labour trader; and Jim Wilbur, the founder of the Nduindui trading station in Omba. The external commerce of the islands was also in British hands, largely in those of Burns, Philp and Company. But there had always been a small number of French settlers; and in New Caledonia there was considerable interest in the economic and political future of the group. In 1882 this interest found effective expression in the formation at Noumea of the 'Compagnie Calédonienne des Nouvelles-Hébrides'. The moving figure in this enterprise was John Higginson, a naturalized French subject of British birth. His object was both commercial and political. The company immediately set to work acquiring land. By 1885, according to Higginson, it had obtained seven-eighths of the lands formerly held by British settlers, in addition to large tracts acquired directly from natives. Its total claims covered more than half the area of the entire group. Some of the British themselves, including MacLeod, became agents of the company, and some became naturalized French subjects. New settlers came both from New Caledonia and metropolitan France, and the French government showed them increasing favour. By the beginning of the present century the French outnumbered the British in the group by more than two to one.

The Beginning of Political Control

When France annexed New Caledonia in 1853 there had been no reason for extending her control to the neighbouring New Hebrides. Similarly Great Britain disregarded the request of the chiefs of Aneityum in 1857 that they be placed under British protection. But after the development of the labour traffic and of permanent European settlement neither Power was able any longer to ignore conditions in the group. From 1865 onwards British warships were frequently in the New Hebrides, punishing natives for offences against Europeans and investigating the offences of Europeans against natives. This was not, however, in itself sufficient; and between 1870 and 1878 there were many petitions, by settlers and missionaries, to both Britain and France, for annexation. In the latter year the two Powers tried to put an end to this agitation by making public declarations that they had no intention of altering the political status of the group.

Conditions, however, were opposed to the maintenance of the *status quo*. The establishment of the Western Pacific High Com-

mission in 1877 brought British settlers within the jurisdiction of a British court and also made it possible for them to obtain regular titles to their lands. French settlers feared that they would be gradually forced out. At the same time Higginson was intensifying his campaign for French annexation in New Caledonia, and a similar campaign for British annexation was being carried on in Australia.

More imperative than these fears and aspirations, however, was the actual disorder in the islands. Over 20 Europeans are said to have been killed by natives in the years 1882-6. Many more settlers suffered the pillaging of their stores and houses. In 1886 the government of New Caledonia decided to take action upon its own responsibility. Troops were landed at Vila and Havannah harbour in Efate, and at Port Sandwich in Malekula, to punish offences and to protect French settlers. This led to fresh discussions between the British and French governments and to an attempt to combine the maintenance of independence with the preservation of order in the islands.

The convention of 1887 provided for the setting up of a Joint Naval Commission, to be composed of two British and two French naval officers. This body was charged with the protection of British and French interests. Its powers, however, were quite inadequate; and it could only function at all when British and French warships happened to be in the New Hebrides at the same time. To supplement it, Britain appointed a consul and vice-consul in 1888, French settlers organized the municipality of Franceville at Vila in the following year, and settlers of both nationalities combined in 1895 to establish a court; but all these ventures were abandoned as contrary to the terms of the convention.

By about 1900, however, it was evident that some change must soon be made. In the following year France conferred on the Governor of New Caledonia powers similar to those possessed by the British High Commissioner for the Western Pacific. In 1902 a British Deputy Commissioner was appointed to the islands, and a similar French appointment was made shortly afterwards. Meanwhile discussions between the British and French governments as to the outlines of a permanent settlement had begun. In February 1906 a mixed commission met in London. Its deliberations resulted in the diplomatic act of the following October establishing an Anglo-French condominium.

The New Hebrides under the Condominium

The 1906 convention has been called 'a footnote to the Entente Cordiale'. Its terms owed more to the desire of both British and French delegates to reach agreement than to close study of conditions in the islands. It provided for a jointly controlled condominium administration with limited functions, and for separate British and French administrations with jurisdiction over British and French subjects respectively. This complex division of powers, which was most rigidly defined, had little chance of proving satisfactory in the changing conditions of a territory not yet emerged from the pioneering stage. Further, in their preoccupation with the relations between British and French, the members of the commission had failed to make any adequate provision for the introduction of a system of native administration. Many of the more specific flaws were removed in a new convention, which was signed in 1914 just at the outbreak of the European war and finally ratified in 1922. With various more recent minor modifications, this forms the present basis of government in the group.

The economic history of the group since 1906 is dealt with more fully below (pp. 560-8). European interest in the growing of coconuts, cocoa and coffee increased fairly steadily until the slump of 1931 and following years; but the British share in New Hebrides trade and agriculture declined very greatly, while (owing to governmental assistance) the French share much increased. Only since the beginning of the present war has the situation begun once again to favour, in some measure, the British settlers and to make the position of the French rather difficult.

PEOPLES

COMPOSITION AND TRENDS OF POPULATION

No complete census has ever been taken in the New Hebrides. The numbers of non-natives—both European and Asiatic—are accurately known through their registration at either the British or the French Residency; but, except for a few islands, the figures of native population are only rough estimates.

Non-native Population

In 1938 the European population numbered 935, comprising 219 British subjects, 687 French, and 29 others. Asiatics numbered

2,183. Of these 2,023 were Indo-Chinese (almost without exception labourers brought in under indenture, or members of their families); 93 were Chinese; and 67 were Japanese. The main centres of European settlement are the islands of Efate (where in 1938 there were about 420 French and 63 British subjects) and Espiritu Santo (where the numbers were 220 and 22 respectively). The proportion of British settlers is higher in some of the smaller islands, notably in those of the southern group, where there have never been many Frenchmen, and in Raga and islands northward to the Banks group, where British missionary and trading interests have always been predominant. The Indo-Chinese reside principally on the French plantations in Efate, Malekula and Espiritu Santo. Most of the Chinese are settled near Vila, where they engage in trading and market gardening. Before the war, most of the Japanese also were living in or near Vila.

Native Population

In 1936 the native population was estimated to be slightly over 47,000. This was distributed as follows:

Native Population of the New Hebrides, 1936

Group or Island (including off-lying islets)	Population
Torres islands	170
Banks islands	2,300
Omba	5,000
Maewo	400
Raga	6,000
Espiritu Santo	4,100
Malo	600
Malekula	11,350
Ambrim	4,000
Paama	2,000
Lopevi	150
Epi	800
Tongoa	1,350
Ermae	300
Efate	2,000
Eromanga	391
Tana	5,721
Aniwa	176
Futuna	259
Aneityum	216

Based on *L'Océanie Française*, vol. xxxiv, p. 15 (Paris, 1938).

Reliable estimates of the pre-European population of the group are not obtainable; but it is certain that a very great reduction in numbers has occurred since the beginning of regular European intercourse with the group about a hundred years ago. More detailed figures are available for the southern islands than for the remainder of the group, owing to the early establishment of Christian missions upon them. Even here, however, the figures can in many cases be regarded only as approximations.

Depopulation in the Southern New Hebrides

Island	1871	1884	1895	1898	1917	1936
Aneityum	1,500	934	670	517	320	216
Futuna	—	437	330	—	320	259
Aniwa	250	167	190	160	159	176
Eromanga	—	2,200	1,745 (1894)	1,500	(1921) 484 (1921)	391

Based on: P. A. Buxton, 'The Depopulation of the New Hebrides . . .', *Transactions of the Royal Society of Tropical Medicine and Hygiene*, vol. XIX, pp. 441-3 (London, 1926).

This Table shows that in Aneityum, Futuna and Eromanga (as in many other parts of the group) depopulation has gone on almost constantly since records began to be kept and that it still continues. In some islands, indeed, the reduction in numbers in recent years has been at a much greater rate than formerly. In the interior districts of Espiritu Santo the population is believed to have decreased by over 90 per cent. between about 1895 and 1925.

From 1860 to 1900 the activities of labour traders doubtless contributed substantially to this decline; and the conduct of all classes of Europeans in the islands—sandalwood traders, missionaries and planters—was generally disruptive of the settled ways of native life. The sale of firearms and, more important, that of alcohol, have also been contributory factors. But the continuance of decline, and more especially its rapidity in the interior of Espiritu Santo where even now few Europeans have ever penetrated, show that these are not the main causes. In the New Hebrides, as in most other parts of the Pacific, a factor of primary importance in depopulation is clearly introduced disease.

Owing to the prevalence of endemic diseases—of which the most serious are yaws and malaria—and, in more recent times, to the

debilitating effects of liquor and of a poorly balanced diet, the people have generally been unable to withstand newly introduced infections. Frequently, too, they have been without European medical assistance during periods of epidemic; and sometimes they have been distrustful of the treatment which was offered. The missionary John G. Paton writes, for example, of an epidemic of measles on Tana in 1860, when many refused medicine and advice and instead dug deep holes in the ground the length of their bodies, so that they should be cool, and thus 'died literally in their own graves'. The devastating effect of some of these epidemics can be illustrated from estimates of mortality. It is believed that a third of the population of Eromanga (then estimated at 6,000) died of measles in 1861; a similar proportion of the population of Aneityum died at about the same time from measles combined with a simultaneous failure of the crops; and over a quarter of the people of Futuna died in 1893 from dysentery. And each of these islands, in the course of the last century, has experienced a number of epidemics, all more or less severe.

Two factors which have hindered the restoration of the population are reduction in the birth rate and the excess of males existing on most islands. The former seems to be a direct consequence of the disruption of native society—older marriage customs have fallen into disuse; and methods of abortion, which have always been known, have probably been used more. This, however, may be only a temporary phenomenon. The cause of the excess of males is not clear, but that it has been a fairly general phenomenon is shown by the figures for three of the most populous islands. In Ambrim in 1916 there were 3,153 males and only 2,438 females; in Tana in 1924 the figures were 3,075 and 2,797 respectively; and in Epi in 1925 they were 1,154 and 1,019. A similar situation has been found to exist in other islands for which reliable data are available: the proportion of males per 100 females has varied from 105 in Einau to 149 in Aneityum. All these figures relate to the situation twenty years ago, but there is reason to believe that the position is still not greatly altered.

The only areas in which population has been ascertained to be rising are Tana, Aniwa, Paama, Tongoa, Tongariki, Buninga and the north of Raga. The most consistent increase is shown on Paama, where the population was given as 1,700 in 1900, 1,742 in 1916, 1,811 in 1925, and 2,000 in 1936. The causes of the stability and growth on these islands are at least as complex as those of the continuing decline elsewhere. They are partly sociological and partly

physical. On the one hand, the people of these islands seldom go away to work; they remain on their own lands, live under their own social system, and produce copra and other crops to provide money for the purchase of European goods. On the other, the islands are unusually healthy; with porous, volcanic soil, there is little stagnant surface water, and the proportion of the people infected with malaria is unusually small. These facts have a wider significance, for the general revival of native agriculture is not beyond the competence of an efficient administration with adequate financial resources, and the draining of the breeding places of the malaria-carrying *Anopheles* would in many areas be a comparatively simple work.

THE NATIVE PEOPLES

Physical Type

The people of the New Hebrides are mostly Melanesians, but they show a considerable range of physical type; there is also some admixture of Polynesian blood, especially in the east and south. In the interior of Malekula and Espiritu Santo there are in addition small numbers of people of pygmy type, who can apparently be classed as Negrito.

The Melanesians have as a rule skins of a dark chocolate colour, though those of Omba are notably light. Their heads are broad, except when artificially deformed. They have pronounced brow ridges over the eyes, and their noses are large and either broad or aquiline (Plate 83). Their mouths are large and protruding, and their jaws heavy and prognathous. The rugged features of the older men are often given a more striking appearance by a stick thrust as an ornament through a hole pierced in the septum of the nose. Two basic types have been distinguished. The one has an average height of 5 ft. 4½ in., with a long beaked nose; the other has an average height of 5 ft. 3½ in., with a short nose and broader face. Both types are well built, with powerful limbs.

The pygmies, about whom little is known, resemble similar people found in Dutch New Guinea. They vary in stature, and there is no sharp dividing line between them and their taller neighbours, with whom they have intermarried to some extent. But their average height, from sample measurements, is given as 4 ft. 8½ in., well below the average of ordinary Melanesians. They are an active, lightly-built people, of a rather lighter skin colour than their Melanesian neighbours, and have curly hair; the men frequently have a

light moustache and a beard after the age of about forty. Their faces are characterized by a straight, slightly receding forehead, small narrow brow ridges, large but not prognathous jaws, and small mouths. Since they rarely come down to the coast they have not often been seen by Europeans.

Language

A large number of languages and dialects are spoken in the New Hebrides. In general those of the Torres islands, Banks islands and north-eastern New Hebrides are most closely akin to one another, those of the central New Hebrides are more individual in character, and those of Aneityum, Tana and Eromanga in the south form another distinct section. The language of the pygmies has not been studied.

A few of the languages, including those of Futuna and Aniwa in the south, and of Fila and Mele in south-west Efate, are basically Polynesian in character; they are closely related to one another. The language of Emae, a little north of Efate, is also Polynesian but of a rather different type. All these languages have their nearest affinities with those of Samoa, Tonga and other islands in western Polynesia, and not with the other languages of the New Hebrides. That of Fila, for example, though surrounded by the Melanesian dialects of Efate and Nguna, has practically no Melanesian content. But its tendencies to eliminate vowels within a word (as *fatfat* for the common *fatufatu*, breast), to use the sound *dr* as a variant of *r*, and its use of suffixed pronouns, are not normal in Polynesian and do resemble Melanesian usage.

By far the greatest proportion of New Hebrides languages are Melanesian, akin, for instance, to those of Fiji and New Caledonia (pp. 149, 452). They have essentially a common grammatical structure and a common phonetic system. But even in these aspects their variation is considerable, and they show a great diversity of vocabulary—except in cases where they use a common Indonesian root. The number of languages and dialects is therefore considerable, some of them being mutually unintelligible even within a small radius. On Malekula alone, for instance, there appear to be more than a dozen dialects. In the Banks islands more than two dozen dialects have been recorded, each district or group of villages, even on a small island, having its own. Mota, for example, had formerly two well-defined dialects, in this case differing little in vocabulary but with marked phonetic change, and associated with

missionaries in the south, which indeed has been apt to vary from one island to another. And a symbol used in the New Hebrides for one type of sound may be used elsewhere in Melanesia, as in Fiji or in the Loyalty islands, for an entirely different type of sound. Thus the letter *g*, used in the northern New Hebrides for the sound of *g* rather as in the English word 'go', represents in the southern New Hebrides (and in the local alphabet of Fiji) the sound of *ng* as in the English word 'sing', while in the southern New Hebrides the *g* sound is represented by the letter *c*. The letter *q*, used in the local alphabet of Fiji for the sound of *ngg* as in the English 'finger', is used in the northern New Hebrides for a compound sound often equivalent to *kpw*, while the *ngg* sound in the latter area is represented by the letter *g* in different font of type from the body of the word (italic type in a word printed in roman, or roman type in a word printed in italic). Thus the Epi word for a canoe, *waga*, is the same as the Fijian *waqa*. The complexity is rendered greater because of the phonetic changes that occur from one island or dialect to another; even though a symbol represents the same type of sound in an area the sound itself may vary in different parts of the area. Thus the symbol *q*, standing basically for a compound guttural-labial sound of a plosive type, may correspond to *bw*, *kw*, *kpw*, *kmbw* or even *nggbw* in different dialects. The orthography has been constructed primarily for native use, and in each case the native has no difficulty, since he reads the symbol as it is locally pronounced. But it is necessary for a European to learn the alphabet of each language or dialect separately.

Through the efforts of the missions there is now a considerable body of literature in New Hebrides dialects, mainly in the form of grammars, vocabularies and religious books. Among the languages best represented are those of Aneityum and Eromanga in the south, Nguna and Efate in the centre of the New Hebrides, and Mota in the north-east and the Banks islands. Mota was for a long time the *lingua franca* of the Melanesian Mission, and had considerable currency in the south-east Solomon islands as well (p. 634). For ordinary intercourse with Europeans outside the missions 'pidgin English' is widely used, and some knowledge of English itself is now becoming more widespread.

Despite their apparent complexity and the small geographical range of many of them, the Melanesian languages of the New Hebrides are by no means primitive. That of Mota, for instance, has been regarded by the Melanesian Mission as full, flexible and precise

enough for use as a general teaching medium; its vocabulary contains at a rough estimate at least 7,500 words.

One of the sociological features of many of the New Hebrides languages which deserves notice is the avoidance in speech of words which form part of the names of relatives by marriage. For instance, in Mota, a person whose father-in-law, brother-in-law or son-in-law is named Pantutun ('hot hand') may not use the word *paneï* for 'hand' or *tutun* for 'hot'; other words must be substituted. Thus the word *limai* will be used instead of *paneï* in all circumstances. To break this rule gives great offence.

Culture

European Influence

The degree to which the native population of the group has been affected by contact with Europeans varies considerably. Many of the people dwelling near the coast are fully 'missionized', though their understanding and practice of Christianity are often superficial. Many have been recruited for labour on the plantations of the British and French settlers. But the inhabitants of the inaccessible interior of the larger islands have been little affected by European contact, though they have acquired firearms, mostly of old pattern. Cannibalism is reported to survive in a few places. The Big Nambas people of northern Malekula are still almost untouched by European influence. Traders and planters have described them as fierce and treacherous, but the few scientists who have visited them consider that this view is exaggerated. They owe their immunity from civilization to the difficulties of the country, to their reputation for treachery (engendered by a justifiable distrust of their European neighbours) and to their tribal organization, which is more cohesive than that of the coastal groups, and has hindered their recruitment for labour.

Where European interests have been at work, native social organization and native culture have been destroyed almost completely. This is particularly true of the southern New Hebrides and of the Banks islands, where the population is nominally all Christian. But the institution of *sukwe* (p. 548) still survives, despite the disapproval of the mission.

The character of the people is not prepossessing on first acquaintance. They are apt to be suspicious—to some extent a legacy of the harsh and unscrupulous treatment meted out to them by the early settlers. Women and children will usually run away on the approach of a stranger, and the men are particularly jealous of their

wives. Though they are keen traders, they will frequently refrain from offering objects for barter because a refusal to negotiate would lay them open to ridicule. But where native institutions have survived, the people are hospitable when their suspicions are overcome. The men make good labourers but prefer short-term or casual labour to long-term contract labour on plantations. Some

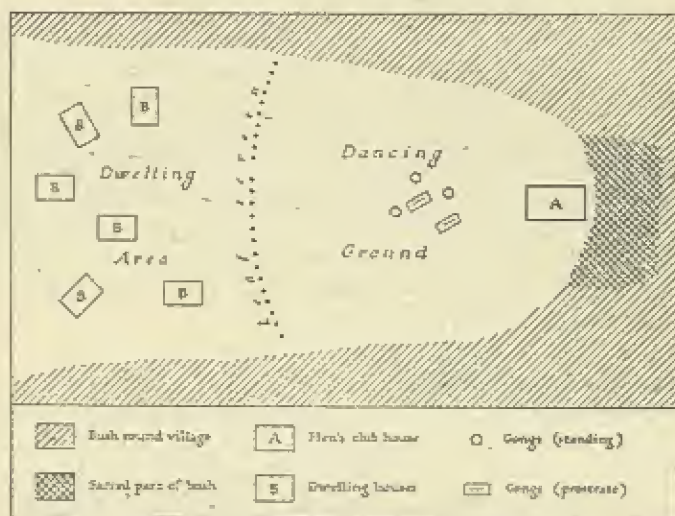


Fig. 173. Village in Seniung district, Malekula

Diagrammatic sketch to illustrate the division of the village into a sacred (*ileo*) part, where the men's club house is situated, and a common (*igah*) part. The two are divided by a leaf screen. Women are allowed on the dancing ground only on ceremonial occasions. Based on A. B. Deacon, *Malekula*, p. 24 (London, 1934).

are employed as police, government messengers, boats' crews and stevedores.

Villages

Villages consist of a few huts, sometimes scattered about in the open at random, sometimes in compounds. In pagan areas, each village generally contains a *gamal* or men's club-house, and a dancing-ground with upright slit-gongs (Plates 85, 86). Rectangular compounds surround the houses of some villages; they are formed of low stone walls surmounted by high screens. Narrow lanes lead between the compounds. Inside each are one or two small houses, a yam shed and a pit for cooking. In the southern New Hebrides, a rough stone wall is sometimes built round the village to keep out

pigs. In Malekula, the villages of the Big Nambas tribes and of others in the interior are usually fortified and situated on inaccessible hills. Fig. 173 shows schematically a village in south-west Malekula. Here, villages are divided into an *ileo* (sacred) part including the dancing ground and the *gamal*, and an *igah* (ordinary) part including the rest of the village. Women are only allowed to enter the sacred part on ceremonial occasions.

Houses. Dwelling houses are poorly-built structures consisting of a simple thatched roof supported by a ridge-pole and reaching the ground on each side. There are many local variations. In Eromanga, for instance, the framework consists of two parallel rows of sticks driven into the ground and bent over to join in the middle. The finished dwelling closely resembles a Nissen hut in shape. In some parts of Malekula and Espiritu Santo, dwellings are little more than rock-shelters. Where missionary influence is strong, houses are often built of a mixture of lime and mortar, and near Vila, house construction generally follows European lines.

Food Production and Exchange

Like other Melanesians, the natives of the group are keen gardeners and their diet is primarily a vegetable one, supplemented by fish, and by meat obtained by hunting or by the sacrifice of pigs. Yams are the staple crop, but coconuts, breadfruit, papaya, bananas, sugar cane and taro and other vegetables are also cultivated. The gardens consist of rectangular clearings in the bush at a little distance from the villages; they are fenced to keep out the pigs. Land is usually allowed to lie fallow after a crop. The women do the lighter work, and the heavy work of clearing the ground and erecting fences is left to the men. These fences consist of double rows of posts driven into the ground with logs laid between them. At harvest time, relatives and neighbours help one another.

Wild pigs, the only mammals of any size, are hunted or snared with spring nooses. Fish are caught by hook and line, poisoning, spearing, shooting with bows and arrows, and by organized fish drives against weirs or palings at the mouths of streams.

Canoes. Canoes are used primarily for transport and for trade, and less commonly for fishing. The inhabitants of Vao and other small islands off the east coast of Malekula, who own gardens on the mainland, use canoes to cross to them daily. Much longer voyages were made in former times to trade in pigs.

The canoes are all dug-outs with a single outrigger which is con-

nected to the booms by an indirect attachment of simple construction. Some have raised washstrakes. They vary in shape according to locality, but all are small, roughly made and bluff at both ends. None can carry more than 6 or 8 people, though in the past canoes capable of carrying as many as 40 passengers were in use. The sails used are a variant of the Oceanic spritsail, V-shaped with a characteristic curve in the head of the sail. There is no mast in the true sense of the term, but only a yard and a sprit, both of which are stepped to one of the thwarts formed by the outrigger booms and are stayed appropriately. As elsewhere in the Pacific, canoes are sailed with the outrigger to windward.

Pigs. While yams are the principal foodstuff, and plaited grass mats or strings of shell beads are used as small currency, wealth is primarily reckoned in pigs. These are frequently animals with artificially deformed tusks (Plate 84), and in some cases are hermaphrodites (p. 525). The value of the pig increases in proportion to the growth of these tusks and has no relation to its size or weight. A pig with tusks nearing completion of the second circle is worth about £60. Pigs with curved tusks are used primarily for sacrificial purposes (p. 549), but they also play an important part in ceremonial exchange and in ordinary economic life. On getting married, a man borrows pigs from his relatives to present to the bride's family. He also has to sacrifice pigs to achieve advancement in the graded society (p. 548). Pigs are also used for payments for specialist services, as by sorcerers and craftsmen. Repayments for loans of pigs are made with pigs whose tusks have reached a length equal to that attained by those of the borrowed animal in the meantime. The growth of the tusk thus represents the interest payable on the loan. Great care is lavished on pigs. Anyone wantonly killing a tusker is not only injuring the owner's pocket but is killing a sacred animal.

Social Organization

Native communities in the New Hebrides are usually small. The basic social unit is the family consisting of a man, his wife and their children. The individual family forms part of a larger unit, the clan. Clan membership is based on descent traced through the father's or the mother's line. In the Banks islands and the northern New Hebrides, matrilineal descent is the rule; in all the islands to the south, patrilineal descent is the rule. But in either system duties extend to relatives outside one's own clan. For example, in patrilineal communities a man's

mother's brother will sponsor him at initiation into various grades of the men's societies (p. 549). Totemism is not prevalent, but some clans, notably in Tana, treat certain birds such as the flycatcher and long-tailed tit as clan badges; some people believe that these birds are reincarnations of former clan members. In some parts of the New Hebrides one clan, together with those persons who have married into it, will occupy a whole village; in others, several clans may live in the same village. A group of clans bound together by loose ties of common language, culture and proximity forms a tribal group.

An alternative to the clan system in some areas, but usually complementary to it, is the division of the tribal group into two halves or moieties, each of which may contain several clans. Matrilineal descent generally operates where there are these moieties. A particularly complex form of organization is produced when, as on Ambrim and some other islands, a system of patrilineal clans exists in conjunction with one of matrilineal moieties. This gives rise to a grouping of the people by 'sections', sometimes called 'marriage-classes'.

Marriage is permitted only between members of different clans. Polygyny is practised only by a few of the older and wealthier men—the young men can hardly afford more than the necessary number of pigs for one wife.

Under the clan system rights and duties extend farther than in European families and are important in regulating behaviour, as when at harvest time a cultivator calls in the assistance of fellow clansmen. Clans show considerable solidarity and corporate responsibility. The whole clan will support a member involved in a dispute with outsiders. Similarly, by outsiders, a clan is held responsible for the deeds of its members. There is thus good reason for each clan to see that its members conform to accepted standards of conduct. In dealings with other clans there is great fear of reprisals, particularly in the form of sorcery. The chief causes of strife are adultery and trespass in gardens by members of a strange clan.

Land Tenure and Inheritance

Land owned by a tribal group or clan may be divided into three categories: bush land which, in some areas, is open to cultivation by anyone; cultivated land, which is frequently private property; and village sites, which are communally owned. There are many local

variations in the pattern of land tenure and inheritance. In Seniang (in south-west Malekula), for instance, the clans own clearly defined tracts marked off by lines of trees, or, in coastal districts, by low walls of coral blocks. The land belonging to each clan is divided into plots, cultivated and uncultivated, belonging to different families within the clan. Each man has the use of a piece of land, which he divides before his death between his sons or grandsons. In Seniang, the women, although they work in the gardens, have no property rights in them. But in some other parts of the group they can inherit both land and goods. While land may not be permanently alienated, a man may let it to someone else for cultivation, usually only for a year. Trees growing on a plot of land may well belong to a different person from the owner of the land, as they are commonly the property of the man who planted them.

In areas where there are hereditary chiefs, land may be divided for use by individuals, but ultimate ownership is vested in the chief as trustee of the clan or tribal group. In the early days of colonization planters frequently acquired from such chiefs land which (according to native custom) these men were not entitled to alienate.

Rank and Chieftainship

As a general rule there is no hereditary chieftainship in the New Hebrides except in the south and in one or two scattered tribal groups in Malekula. Few chiefs now survive and their authority is everywhere greatly diminished. Affairs affecting a whole island are settled nowadays, so far as the natives are concerned, by a meeting of all the chiefs. Where there is no chieftainship, political decisions are usually made by discussion among



Fig. 174. Pudding spoon

These spoons, or knives, were made and used in the Banks islands to cut puddings of taro, breadfruit, etc. Their handles were often elaborately carved. Some were used only in certain ranks of the graded societies (p. 548). Drawn from an example, 2 ft. 6 in. long, in the Museum of Archaeology and Ethnology, Cambridge.

the senior men, whose social position is dependent on their rank in the graded societies.

Graded and Secret Societies

In the northern New Hebrides and Banks islands, most villages possess a house rather larger and better built than the rest. This is commonly known as the *gamal* or club-house. It is occupied by the men above the age of initiation, who all belong to an organization which may be called a graded society, or public graded institution.



Fig. 175. Wooden mask from Omba

This mask, coloured with red and white paint, is of the type formerly worn by men who dressed as 'ghosts' in ceremonies associated with yam planting. Attached to the mask was a long grass fringe completely concealing the wearer's head. Drawn from the original, 13 in. in greatest length, in the Museum of Archaeology and Ethnology, Cambridge.

Locally, these societies are known by various names (Fig. 172), two of the commonest being *sukwe* and *mangke*. All contain certain common features. They are organized in steps or grades through which members pass only by buying their way. Only a few men, by industry and wealthy connections, reach the highest grades. One of the essential features of each graded society is the division of the club-house into sections, the rank of which advances as one proceeds to the back of the house. Only those who have reached the appropriate grade are entitled to enter the corresponding section of the club-house.

The functions of these societies are largely religious. Men consecrate themselves therein, to ensure for themselves an after-life, by the ceremonial sacrifice of tusked pigs and by the erection of stone monuments and wooden gongs to the memory of their ancestors. But each society also plays a major part in the social and economic life of the village, and political authority, too, is vested in its higher grades.

Initiation into the societies and advances from one grade to another are costly. A man's introducer or sponsor must be given a pig. He prepares a feast for the candidate, who makes a small cash payment to the sponsor. In the higher grades the candidate still requires a sponsor, but he himself now has to pay for the feast. Curved-tusked pigs are also sacrificed and ceremonial payments must be made in shell-money. The heavy expenses of the feast, at which the whole community is entertained, often cause the candidate to borrow heavily from his friends, and are a principal motive for the acquisition of wealth. They also stimulate the rearing of pigs, which plays such an important part in New Hebrides culture.

Women's societies akin to the *sukwe* occur in some places. Entry is by an initiation ceremony in which the two upper incisor teeth are extracted. Men are excluded. Just as men acquire prestige and

supernormal power (*mana*) by rising in the *sukwe*, women acquire analogous powers but of a different quality—*igah* as opposed to *ileo*.

There are also secret societies such as the *tamate* and *qatu* of the Banks islands, which are akin to, but not identical with, the graded



Fig. 176. Head with tusks from Malekula

This effigy represents a mythical figure prominent in the fertility ceremonies conducted by the Nevinbur secret society in the Seniang district, in south-west Malekula. It is in clay, and is said to be modelled on the skull of a former member of the society. It is brightly coloured with red, blue and white paint. Height about 14 in. Drawn from the original in the Museum of Archaeology and Ethnology, Cambridge.

societies. They have now largely died out. Their function was of a disciplinary nature, achieved by the impersonation of ancestral spirits. Noises, supposed to be the voices of spirits, were produced by swinging bull-roarers and by rubbing stalks of palm leaves on stones. Members wore masks and clothing of grass or fibre which covered them from the head to the knees. In this guise they ran through the village uttering unearthly shrieks, beating anybody they found abroad and singling out for their special attention people who had incurred their displeasure. The occasions were also oppor-

tunities for horse-play and practical joking; prudent men and women remained at home.

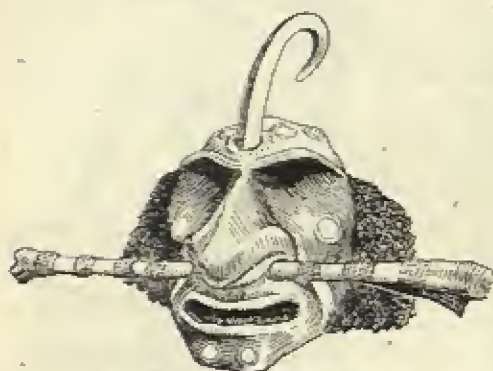


Fig. 177. Mask from Malekula

This mask is modelled in clay. It is painted red on the forehead and black on the rest of the face, with white spots on cheeks and chin and a white stripe down the nose. A human arm-bone is placed through the nose and a pig's tusk in the head. Attached to the back is a 'wig' made of cobwebs. The mask was probably worn as a knee-pad in ceremonies of the Nalawan secret society. Height, excluding tusk, 6 in. Drawn from the original in the Museum of Archaeology and Ethnology, Cambridge.

Religion

The people who are still heathen believe in a supreme being, generally known as Tagoro (who may be analogous to the Tangaroa of the Polynesians), but he is not regarded as a very active controller of the destinies of mankind. Far more attention is paid to ghosts of the departed and to other spirits and nebulous supernatural beings who never had a mortal

existence. Prayers are addressed to them and they are propitiated periodically with food.

Important also is the belief in *mana*. This concept is not easy to define. It corresponds to that kind of efficacy which is so outstanding and so consistent that it is regarded as having a more or less supernatural quality. A man who is more successful in fishing than his neighbours or whose gardens are more fruitful, or a weapon which seems to have special powers of giving victory to its owner, are regarded as having *mana*. Even stones of a curious shape are believed to have this quality and may be placed in gardens to ensure good crops.

Belief in an after-life is very strong and has many manifestations—notably in sacrifice of pigs to ensure survival in the spirit world, and in drawing in the sand complicated designs, a knowledge of which is considered necessary (in some localities) to get past a Cerberus who guards the portals of the next world. In south Malekula a memorial effigy of the deceased is made by modelling a face in clay on a skull and forming a body of tree-fern trunk. The whole effigy is made as lifelike as possible and decorated with the deceased's insignia of rank in the graded society. Gongs and carvings also represent the dead. Skulls and heads modelled in clay are also used in some ceremonies (Fig. 176).

Art

The people of the New Hebrides display considerable artistry in their myths, songs, gong rhythms, mumming plays and figure dances;

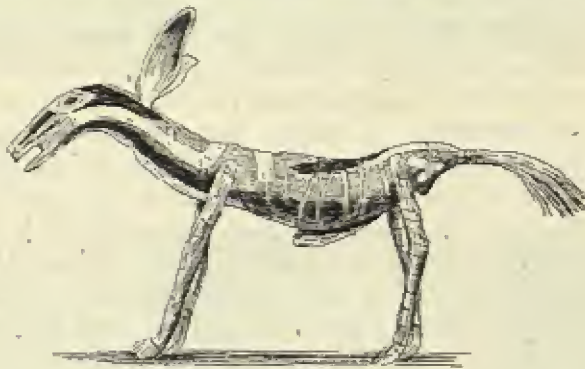


Fig. 178. Figure of a dog

This pantomime dog, made of vegetable fibre and painted with black and white stripes, was worn as part of a head-dress in dances. Length from tip of nose to tip of tail 19 in. Drawn from the original in the Museum of Archaeology and Ethnology, Cambridge.

in the elaborate designs they draw on the sand or in the cold ashes of a fire; in their wood carving and their construction of effigies from bark cloth, bamboo and other materials. As in most primitive societies, their æsthetic interests are very closely bound up with their religious ideas and ritual practices, and much of their art is produced as part of their activities in their graded societies and secret societies. Many of the designs in their decorative art are conventionalizations of the human figure, or of the head or face (Figs. 174-177), and represent ancestral spirits. Others have animal motifs (Fig. 178),

while some, especially the sand tracings, are of rectilinear or circular character and often represent plants, or objects such as canoes.

War and Cannibalism

In former times warfare was frequent. It was often due to trespass or to a dispute over women. It might take the form of a series of skirmishes and ambushes, or of a formal pitched battle conforming to well-recognized conventions. An armistice would be made by the exchange of pigs. The weapons used in pre-European days were clubs, spears (sometimes tipped with human bone), bows and arrows. The arrows had wooden foreshafts which were sometimes poisoned. With the advent of Europeans, firearms were introduced.

ADMINISTRATION

The administrative structure of the New Hebrides is unique in the Pacific owing to the complex division of powers between the Anglo-French condominium administration and the separate British and French administrations. In general, the national administrations have jurisdiction over their respective nationals, and the condominium has jurisdiction over natives and where the interests of British and French clash. The condominium is responsible for most public services other than police. But owing to its restricted powers and small financial resources the range of governmental activity is very limited. Many islands are visited only at long intervals by government officers, while parts of the interior of Malekula and Espiritu Santo are almost wholly uncontrolled. Only the most essential public services have been established.

Central Administration

Executive authority in the New Hebrides is vested in the British High Commissioner for the Western Pacific (p. 171) and the French *Haut Commissaire de France dans les Nouvelles-Hébrides* (p. 415), who are normally resident at Suva (Fiji) and Noumea (New Caledonia) respectively. Neither of these two officers—and more especially the British High Commissioner—has been able to visit the islands at all frequently; and before the war they seldom met each other. They are represented in the group by Resident Commissioners, to whom they have delegated some of their powers. The Resident Commissioners administer the condominium services



Plate 85. A Banks islands house

The use of stone in the lower parts of the walls is very characteristic of building methods in the Banks islands. In the New Hebrides and islands immediately to the northward the roof is commonly brought so low as almost to eliminate side walls, as here.



Plate 86. Gongs and screen in a Seniang village, Malekula

This should be compared with Fig. 173, showing the general plan of a village in this area. The photograph was taken from the direction of the men's club-house. It shows both standing and prostrate gongs. Behind them is the leaf screen dividing the sacred part of the village, in which the gongs are placed, from the common part.



Plate 87. Vila, Efate

From the northern end of Iririki island looking north-eastward. The main pier can be seen on the left, with a cluster of stores and warehouses nearby. The principal administrative buildings are on the slopes behind.



Plate 88. Vila harbour

The view is taken from the northern end of the town. The harbour entrance is seen on the right, with Vila island immediately to the left of it. The British Residency can be seen on Iririki island, on the left.

jointly, and act separately in the services under national control. The administrative centre of the group is at Vila (p. 568).

The Resident Commissioners have no legislative or advisory body to assist them in regard to condominium affairs. But the French Resident Commissioner has the advice on specifically French matters of the *Commission consultative des Intérêts économiques français aux Nouvelles-Hébrides*. This body was instituted in 1910. For many years it was composed of nominated members, but in 1928 a system of popular election was introduced. It has been in large measure responsible for the close contact which has always been maintained between French settlers and officials in the islands.

The staff under the British Resident Commissioner at Vila is very small, consisting only of the Assistant to the Resident Commissioner, the Commandant of Constabulary, and a small number of clerks and messengers. The French establishment was at one time very similar. But between 1920 and 1930, when the French government began much more actively to foster French interests in the group, expansion took place. In particular, a department was formed in 1927, under a *Chef du Service de la Colonisation*, to control the employment of Indo-Chinese and native labour and to deal with matters of immigration and land tenure. Government medical services were also expanded.

The staff under the condominium government includes the officers of the Joint Court (p. 555), the District Agents, and employees of the postal and W/T services and the public works department.

District Administration

For purposes of local administration the group is divided into four districts—Southern (embracing Eromanga and islands to the south of it); Central, No. 1 (including Efate, Emae, the Shepherd islands, and Epi); Central, No. 2 (including Malekula, Ambim, Paama and Lopevi, and Raga); and Northern (including Espiritu Santo and islands off it, Omba, Maewo, and the Banks and Torres groups). In each of these districts it is provided that there shall be British and French District Agents. In the Southern District both British and French headquarters are at Lenakel in Tana. (But owing to the smallness of French interests in the southern islands a French agent is not always stationed there.) In the Central District, No. 1, headquarters are at Vila. In the Central District, No. 2, the French District Agent is at Port Sandwich, in the south-east of Malekula,

and the British District Agent at Bushman's bay, farther north on the same island. In the Northern District the British District Agent was for many years stationed at Hog harbour, in the north of Espiritu Santo, but he has recently been moved nearer to the main centre of European interests and stationed on Venui islet, near the south-eastern entrance to Segond channel; the French District Agent is at Luganville, in the same area.

These officers receive their salaries and the services of a detachment of native police from the British and French administrations respectively, but for all else—such as transport facilities—they are dependent on the condominium. In the performance of their duties they are responsible, similarly, to two administrations. In regard to indentured labour, for example, they act as the representatives of their own Resident Commissioner, but in judicial matters they are the agents of the condominium. The proximity of nearly all the government agencies to plantation areas indicates the scope and the limitations of the work undertaken. The District Agents are largely concerned with the regulation of relations between Europeans, Asiatics and natives. Only the district agencies on Tana are in an area where European interests are small. In one or two other islands, such as Tongoa, a fairly close supervision of native affairs is maintained, but this is exceptional. It is significant that a proposal, first made in the early days of the condominium, to station an agent on Omba—a populous and prosperous island, but one without European planters—has never been carried out.

Law, Justice and Police

British subjects, and other non-natives who have placed themselves under British jurisdiction, are subject to British law; and French subjects, and those who have similarly opted for French jurisdiction, to French law. A code of criminal law applicable to natives has been formulated and put into operation in parts of the group. All persons, without distinction of nationality, are bound by the rules contained in the convention of 1914 (p. 534) and by the Joint Regulations of the two Resident Commissioners. The former of these two bodies of local law relates principally to land tenure, recruiting and employment of labour, and the sale of firearms and intoxicants, and the latter to matters such as customs duties, postal charges, regulation of marketing or agriculture, and the control of local affairs in Vila or other of the more fully administered areas.

The highest judicial bodies in the condominium are the Joint Court and the British and French National Courts, all of which were originally set up under the convention of 1906. The former was until recently composed of a president of neutral nationality, chosen by the King of Spain, and a British and a French judge. Since the retirement of the last president so appointed, the court has sat under the presidency of either the British or the French judge, depending upon the particular circumstances of cases to be tried. A public prosecutor and an official native advocate are also attached to the court. Its most important civil function is to serve as a land court, examining claims submitted by Europeans and registering titles. In criminal matters, its jurisdiction is mainly confined to offences connected with labour recruiting, to other breaches of the convention or of Joint Regulations, to offences by natives against non-natives, and to the more serious offences involving natives alone, if they are committed in areas where the native penal code is in force. It has also certain powers as a court of appeal.

The formal opening of the Joint Court took place in November 1910. At that time it was hoped that within a few years it would be able to settle all the major land disputes in the islands. But it gradually became clear that difficulties of survey, the inadequacy of much of the evidence tendered, and differences of opinion between British and French claimants would make progress extremely slow. Even now the area to which indefeasible titles have been given is relatively small. The court has similarly been unable to put a stop to illegal trade in liquor. At one time its officers have been drawn from as many as four nationalities, leading to sharply conflicting views on judicial procedure and to slow and laborious interpretation of proceedings; its native witnesses have commonly had to be examined through the medium of 'pidgin English'. There have been long periods in which the court has been totally inactive, usually because of the absence from the islands of one or more of its officers. Recently, however, the arrangement whereby the court may sit without a president of neutral nationality has slightly reduced the cumbrousness of the machinery.

The British and French National Courts have jurisdiction over all civil cases not reserved to the Joint Court and over all criminal cases in which a non-native is the defendant. In criminal cases the defendant is tried in the court of the nation to which he belongs, or under the jurisdiction of which he has placed himself; civil cases are disposed of either according to the national affiliation of the defendant

or according to the legal system under which the contract or other act in dispute originated.

The convention of 1914 also made provision for the setting up of Courts of First Instance, composed of a British and a French District Agent sitting together, with an assessor of the same national affiliation as the accused. Jurisdiction is limited to breaches of the convention or of Joint Regulations. Appeal lies to the Joint Court. Courts have been instituted in the two Central Districts and in the Northern District. Their usefulness has been restricted in all but the Central District, No. 1, by the distance between the two government agencies and the lack of adequate transport facilities for the District Agents.

The institution of native courts was also provided for by the convention; by 1938 they were operating in the Southern District and the Central District, No. 1. They are presided over by a single District Agent, assisted by two native assessors. They try the less serious offences under the native penal code.

Police work in the condominium is performed by two separate forces of armed constabulary under the control of the respective Resident Commissioners. Each is commanded by a European commandant and has a strength of 40 native non-commissioned officers and men. The headquarters of both forces are at Vila, and small detachments are stationed at the district agencies in Tana, Malekula and Espiritu Santo. In addition to normal duties in the more settled areas, the constabulary is at times charged with the apprehension of criminals who have fled into the most backward and lawless parts of the group and with the suppression of native disorders in areas under only partial government control.

There are both British and French prisons at Vila and lock-ups at all district agencies. Native prisoners are employed upon public works.

Finance

Administrative machinery in the New Hebrides is adequate to the assessment and collection of only the simplest taxes. In recent years the revenue of the condominium government has usually been between £20,000 and £30,000. In 1938, for example, it amounted to £27,614, of which £16,186 was obtained from import duties and a further £5,079 from postal revenue. The only other significant sources of income were export duties, licence fees, W/T receipts and port dues, each of which amounted to between approximately £900

and £1,200. Expenditure in the same year amounted to £23,917, of which no less than 36 per cent. was absorbed by the Joint Court and a further 30 per cent. by the post office. After other emoluments had been paid, very little remained for public works or social services. The government neither maintains nor assists schools, and though it has taken a more active interest in native medical services only 4 per cent. of total expenditure was devoted to this purpose in 1938.

In the year 1938-9 British national services cost £9,187. They produced virtually no revenue, and—as in all years—were paid for by a Parliamentary grant. French services were formerly in a somewhat similar position. The expansion in them during the last twenty years, however, has been accompanied by the introduction of various forms of taxation falling on French settlers only. By 1929, for instance, out of a total income of 2,935,000 francs (£23,670 at the local rate of exchange) about half was made up by a subvention from the metropolitan government and the remaining half from local sources—mainly from a *per capita* tax on labour employed and a tax on agricultural production.

SOCIAL SERVICES

Medical Services

The health of the native people of the New Hebrides is poor, owing largely to an inadequate diet and to bad sanitary conditions. Climatic conditions, except in the south, make the islands somewhat unhealthy for Europeans. Among all sections of the population—native, European and Asiatic—the most prevalent of serious diseases is malaria, which causes many deaths. Blackwater fever also occurs occasionally among Europeans. Dysentery is extremely widespread. Influenza and, to a less extent, whooping cough have been serious scourges among the natives—particularly in the poverty-stricken interior regions of the larger islands—since they have tended to lead to tuberculosis of the lungs and to other pulmonary complaints. Yaws and hookworm are still very common, despite an organized campaign of treatment carried on over many years by the condominium government in conjunction with the Rockefeller Foundation.

There are two well-equipped hospitals at Vila—the John G. Paton Memorial Hospital, maintained by the Presbyterian mission and subsidized from British funds, and the French government hospital. There are other French hospitals, somewhat smaller and less well equipped, at Luganville, in Espiritu Santo, and Norsup, in Malekula.

At Lenakel, in Tana, there is an excellent Presbyterian mission hospital, assisted by a British subsidy, and a French hospital. All these institutions are normally under the control of European medical practitioners. In addition, the Melanesian Mission maintains a hospital at Lolowai, in Omba, but in recent years it has been without a qualified medical superintendent.

The French have brought several Indo-Chinese medical men to the New Hebrides, and have stationed them in areas where there were considerable numbers of Indo-Chinese and native labourers. One has usually been stationed at Port Sandwich, in charge of a medical aid post. The condominium government has given its support to the scheme for the training of native medical practitioners at the Central Medical School (p. 188), at Suva, Fiji. Several New Hebrideans have received training there. By 1938 two had returned to the group. They were stationed in Malekula and Espiritu Santo respectively, but made periodical tours of native communities in other parts of the group. The Melanesian Mission has usually had several European trained nurses in the islands—stationed at Lolowai, and at Lamalanga on Raga. In addition, nearly all European missionaries have received some simple medical training, and many have performed much medical work among the native people.

Education

With the exception of an infant school in Vila maintained by the French administration, education in the New Hebrides is entirely in the hands of the missions. Two schools in Vila and one at Second channel, all under Roman Catholic control, provide primary education for children of all races, including Europeans. The remaining schools in the group are intended primarily for natives. Amongst the most important of these are the Presbyterian teacher-training school at Tangoa, off the south coast of Espiritu Santo, the boys' and girls' schools of the Melanesian Mission at Lolowai, and the manual training school of the Seventh Day Adventist mission at Port Lautour, on the south coast of Aore.

Missions

At the present time, as formerly, the most important missionary body in the New Hebrides is the Presbyterian mission. Its European staff is now smaller than it was formerly. The mission possesses, however, a body of highly trained native teachers; and the area which

can be effectively covered by one European missionary has been much increased by the provision of motor launches. The mission is unusual in that it is an independent body, supported by, but not responsible to, Presbyterian churches in Australia, New Zealand and elsewhere. It has stations in all parts of the New Hebrides except those covered by the Anglican Melanesian Mission. In religious matters it has been rather inflexible, banning much traditional native ceremonial which other missionary bodies have considered harmless. On this ground it has been widely criticized, since it has reduced still further the few remaining links of the people with their past and so has added to the psychological factors associated with the decline in population. On the other hand, the mission has been very successful in its medical work and in its training of teachers.

In the Banks and Torres islands and in the islands of Omba, Maewo and Raga in the main group the oldest established mission body is the Melanesian Mission of the Church of England. Its headquarters for the New Hebrides are at Lolowai, in northern Omba, where there is a large church and also schools and a hospital. Formerly it had several stations under European missionaries in the Banks and Torres islands and in Raga and Maewo. Of these only Lamalanga, in northern Raga, still has any European staff. The mission has found it possible to entrust most of its ordinary pastoral and educational work to its native priests and deacons and to keep its European members at headquarters at Lolowai. There they engage in the more advanced forms of teaching, but from that central point they are able to make regular visits to the outer districts. Recently the native brotherhood of the mission has begun work in Vila, so as to be able to continue ministering to natives of the northern islands who have moved south to work.

Roman Catholic mission work was begun in the New Hebrides about 1885 by the French society of Marists. The group is organized as the Vicariate Apostolic of the New Hebrides and is under a bishop, who resides at Vila. The society maintains a considerable number of priests and sisters in the islands, many of whom have spent very long periods in the group. Because of their nationality, they have encountered much antagonism in some islands owing to the native dislike of French labour recruiters.

A more recently established mission is that of the Seventh Day Adventists, whose main field of work is the central portion of the group, comprising Malekula, Ambrim, and the south of Espiritu

Santo. There are also Seventh Day Adventist mission stations on Tana and Omba. The number of adherents is small.

On the island of Omba there is a branch of the Church of Christ, with headquarters at Nduindui. It is completely controlled by its native members.

ECONOMICS

The economy of the New Hebrides is based principally upon agriculture. In addition, there is small-scale exploitation of the products of the indigenous forests and of the coastal waters. Formerly sulphur deposits on the island of Vanua Lava were worked commercially. It is commonly believed that the group, like the neighbouring territories of New Caledonia and Fiji, may contain valuable mineral deposits; but so far no significant discoveries have been made and no organized prospecting has been carried out.

TYPES OF ECONOMIC ORGANIZATION

The native people of the New Hebrides cultivate a large variety of food crops for their own consumption (p. 544). They also produce copra, and to a less extent cocoa and cotton, for the market. In coastal districts where coral reefs are well developed they supplement their agricultural earnings by collecting *bêche-de-mer* and trochus and other shells. In the more advanced islands, such as Tana and Omba, the people have enjoyed quite substantial incomes during periods of high prices, and a wide variety of European manufactures, including metal goods, foodstuffs and textiles, have come into regular use among them.

The people of Tana formerly maintained a schooner in which they carried their produce to Vila for sale. This, however, represented native economic enterprise at its highest point. Native produce is normally sold to local traders, who have established themselves at many points on the more populous islands, or to visiting trading vessels. At a few places—such as Nduindui, in Omba—there are old-established and well-equipped trading stations; but, much more frequently, the trader (who is often a mixed-blood) works alone, has only the most limited storage facilities, and keeps a very small stock. This local trade is in turn organized and directed by the few big commercial firms operating in the group, which have their offices at Vila and Segond channel.

Of much greater commercial importance than the activities of

native producers and small traders, however, are those of European planters. In 1938 the area under European cultivation was estimated to be about 50,000 acres. The greater part of this was situated on the islands of Efate, Malekula, Espiritu Santo, Malo and Aore. In addition, there were a few plantations on other islands—including Epi, Raga and Vanua Lava.

Only a comparatively small number of plantations remain under British control; the great majority are now in the hands of French companies or of individual French planters. This predominance has been gained as a result of French official aid to settlement. The first grant to assist French enterprise in the New Hebrides was made as far back as 1882. During the last ten years large sums have been advanced to companies operating in the group to assist them in tiding over the period of low prices, and they, in turn, have assisted individual planters. Preferential treatment in regard to customs duties has been given since 1901, when a rebate of 50 per cent. on New Hebrides products entering France was granted. In recent years French-grown produce from the New Hebrides has been admitted to France and the French colonies on the same terms as French colonial produce, under a quota system.

British enterprise has, on the contrary, received little encouragement. Only in regard to shipping services have they received financial aid, but even in this field French policy has been more generous. There has been a similar difference in the attitudes of the French and British administrations in the islands. British officials have supported the claims of their nationals only so far as has seemed compatible with the protection of native interests; the French, on the other hand, have adopted a consistently sympathetic—or at times actively partisan—attitude towards the demands of their settlers. This difference has been of particular importance in regard to labour policy.

LABOUR PROBLEMS

In the New Hebrides, as in many other parts of the Pacific, one of the principal barriers to the extension of European enterprise is the shortage of labour. The present native population is too small to provide an adequate source of supply. Further, so long as natives can obtain the European goods which they have come to look upon as necessities in exchange for the produce of their own plantations, they are disinclined to enter the employment of the settlers. In 1920 it was estimated that slightly under 4,000 natives were employed by

Europeans. Since then the number has decreased considerably. In particular, many fewer natives are willing to work under contract—at the end of 1938 the number was only 772—and those who do accept contracts will usually do so for a period of only 12 months or less, instead of for the former standard period of indenture of three years.

Many French settlers have sought to make the best of the situation by the adoption of morally undesirable, and often illegal, methods of recruiting and employment. Recruiters have frequently enticed men on to their ships with the promise of abundant 'grog'. Employers have tried to retain their labourers by similarly supplying drink, by organizing prostitution, by neglecting to provide transport home at the end of the period of indenture, and by forcing the acceptance of renewed contracts under various kinds of duress. British settlers, on the contrary, have had to practise stricter obedience to the conditions laid down in Anglo-French agreements; and, in addition, they have been subjected to further restrictions decided upon by the British administration independently. Even French methods could achieve only a limited success, and British settlers have frequently had to let their crops rot through lack of labour to harvest them.

For many years it has been held that the maintenance of a plantation economy in the New Hebrides is only possible with the aid of Asiatic labour. About 1912 French settlers introduced several hundred Javanese and Indo-Chinese from New Caledonia. The war of 1914-18 delayed the inauguration of an organized scheme. But in 1919, when shipping was again available, the Governor of Indo-China authorized the emigration of Tonkinese to the New Hebrides. The first party arrived in the following year. Their numbers increased to 2,250 by 1925 and to over 5,000 by 1929. The first labourers were introduced under a five years' indenture. This period was subsequently lowered to three years; and more rigorous conditions were imposed in regard to wages, conditions of work, and rations. The cost of importing, maintaining and paying them has been estimated to be as low as £36 to £40 a head per year. This introduction of Tonkinese made possible a considerable expansion of French plantation enterprise between about 1925 and 1930. During the years of economic depression, however, many of the planters were unable to afford to import fresh labourers. The number of Tonkinese in the islands dropped to between 1,100 and 1,200 in 1933. Since that time it has increased again, though somewhat slowly, reaching 2,023 in 1938.

Though many British officials have urged the necessity of allowing British settlers to employ Asiatic labourers, no scheme has ever been authorized for their introduction. For many years they were

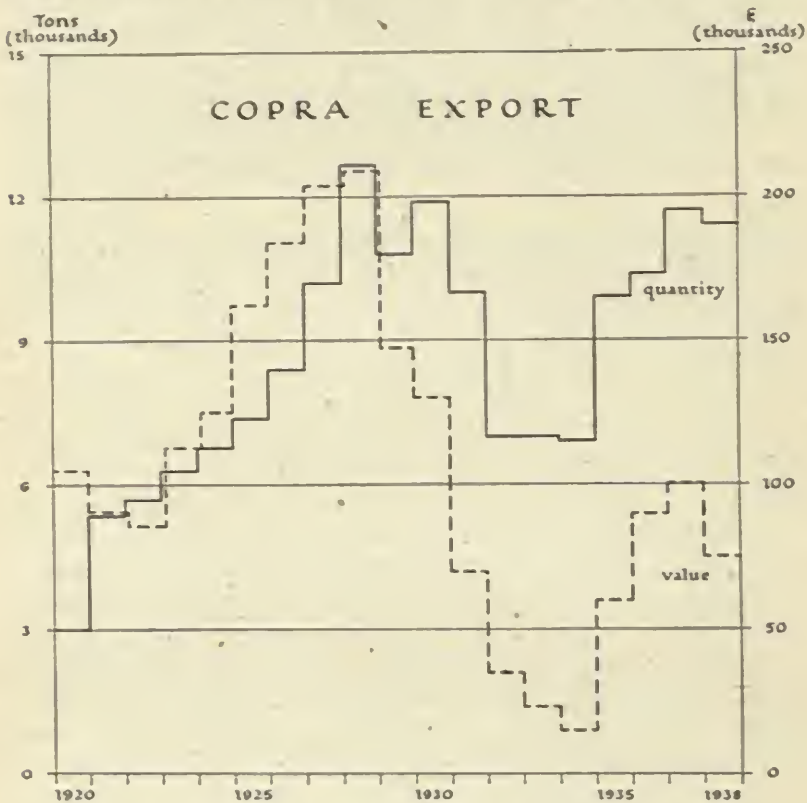


Fig. 179. Export of copra from the New Hebrides, 1920-38
Based on Colonial Office *Annual Report* for 1920-38 (London).

not allowed to engage those brought in by the French, but since 1940 this restriction has been abolished.

Copra AGRICULTURE

As in other parts of the Pacific, the production at first of coconut oil and later of copra has been the principal source of income of the native people, apart from wages. Between 1900 and 1914 the export of copra reached 4,000 to 5,000 tons a year. Most of this was the produce of native-owned groves. But the high prices ruling during

these years had led to the establishment of many European coconut plantations in the group. These began to come into full bearing between 1920 and 1930. In the former year the export had fallen to about 3,000 tons, but by 1928 it had risen to nearly 12,700 tons (Fig. 179). Since that time it has not increased further, owing to various adverse factors. In 1938, out of 50,000 acres under cultivation by Europeans, 33,000 were planted with coconut palms. Native production, on the contrary, has declined in many areas during the past 30 years (partly as a result of depopulation), and apparently

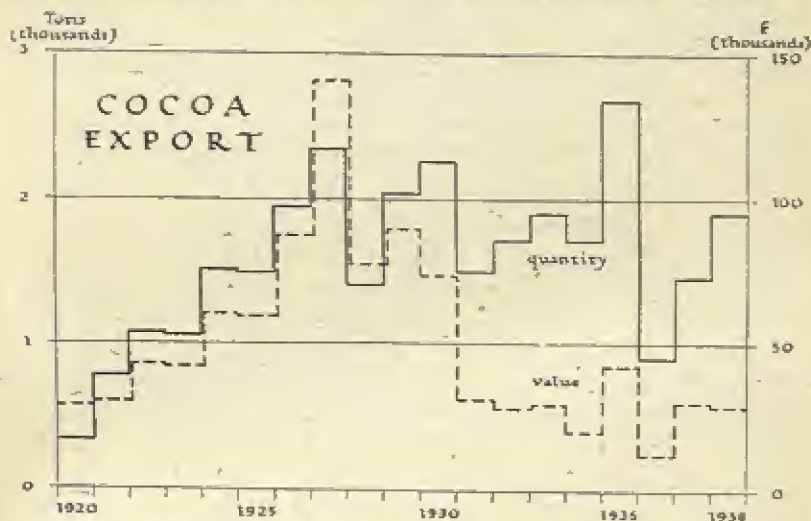


Fig. 180. Export of cocoa from the New Hebrides, 1920-38
Based on Colonial Office *Annual Report* for 1920-38 (London)

increased very little even in the more populous areas. In 1938 it was estimated to account for only one-sixth of the total production.

European production has been hindered by the low prices obtaining since 1931, by labour problems, by hurricane damage (especially in Epi, p. 588), and by the depredations of the moth *Promecotheca*. According to an unofficial estimate production was reduced in some areas by from 50 to 60 per cent. from the latter cause. Since governmental assistance was not forthcoming, the local organization of the French planters, the *Syndicat français agricole*, raised a fund by voluntary subscription to fight this and other insect pests. Profiting by the experience of Fiji they obtained a parasite from Java, which appears to have been successful.

Cocoa

In 1938 an area of 9,000 acres on European estates was planted with cocoa; native cultivation has so far been on a very small scale. As an export crop cocoa has, in the last twenty years, been second in value only to copra, and in two years its value has actually exceeded that of copra (Fig. 180). Owing to lack of a suitable market, and through lack of adequate labour, British planters have never engaged in cocoa growing on more than an experimental scale.

Other Crops

The soil and climate of the New Hebrides fit the group for the cultivation of many tropical agricultural crops; but economic difficulties have often stood in the way of profitable development. Between 1890 and 1900 the cultivation of bananas was undertaken on a commercial scale, but shipping and marketing problems killed the industry. Maize was at one time exported in moderate quantities, and during the establishment of European coconut plantations it was grown between the young palms to provide an immediate source of income. Its place as a catch crop was later taken by cotton, which from about 1915 to 1920 was a major source of income to the islands. Cotton growing was also taken up by natives, notably on the islands of Tana and Omba. In 1926 a fresh advance in cotton-growing was made with the formation of the *Compagnie Cotonnière des Nouvelles-Hébrides*, which established an extensive plantation at Norsup, on the east coast of Malekula. In the same year, however, insect pests became a serious menace on many plantations. The fact that so much of the cotton was growing between coconut palms made it impossible to destroy affected bushes by burning; and, as in other industries, lack of governmental direction made it difficult for planters to take any concerted action. After 1931 the low prices for all crops made it impossible for planters to maintain a labour supply sufficient for cotton picking. Cultivation almost ceased. The value of cotton exported—which had been £75,040 in 1920, £56,294 in 1925, and £26,880 in 1930—was only £966 in 1935.

In addition to copra and cocoa, the only export crop of present importance is coffee, to the production of which 7,000 acres on European plantations were devoted in 1938. This also has been affected by the shortage of labour and by pests, but less disastrously than cotton. A small quantity is consumed locally, and French fiscal policy has provided a protected market for the remainder. In 1938 the coffee exported was valued at £12,876.

Livestock

Sheep, cattle and horses were introduced to the islands by early European settlers. In recent times sheep have been raised only on Eromanga, where there is a European sheep station carrying (in 1938) about 3,000 head. The value of the wool exported has not risen much above £500 in any single year since 1930. Cattle are kept mainly to control the growth of scrub on coconut plantations. On some plantations they are made use of for draught purposes. They

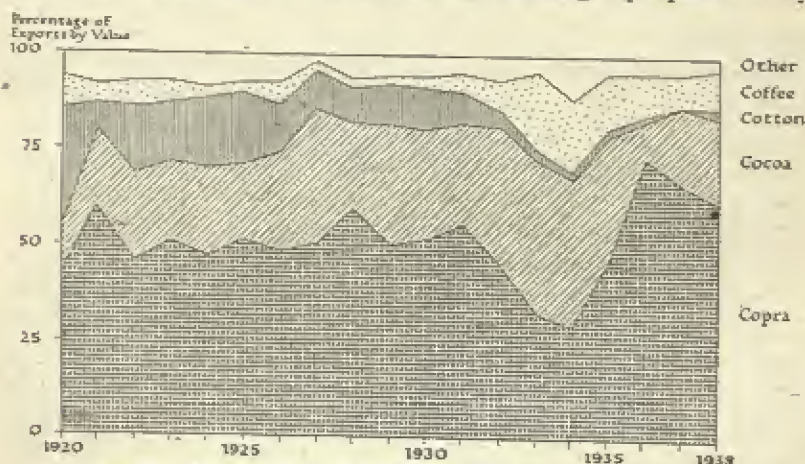


Fig. 181. Proportionate value of New Hebrides exports, 1920-38

The percentage of total exports made up by each commodity is given by the distance between points on the upper and lower boundaries of the shaded area. Based on Colonial Office *Annual Report* for 1920-38 (London).

also provide milk and fresh meat. Hides, to the value of £250 to £400, are exported in most years.

TIMBER

Sandalwood is still moderately plentiful in some islands—including Aneityum, Malekula and Espiritu Santo—despite the ruthless exploitation of the middle years of the last century. A certain amount is cut by natives and sold to traders. In most years the export is valued at between £1,000 and £2,000; but the market is unorganized and somewhat unstable. At Anelgauhut, in Aneityum, there is a small sawmill engaged in preparing the timber of the kauri pine (*Agathis obtusa*) for the market. The islands also contain a number of other trees, mainly hardwoods, of potential timber value, but they have so far not been exploited commercially.

TRADE

Copra has long been the principal export of the New Hebrides; since 1920 the only other exports of importance have been cocoa, coffee and cotton (Fig. 181). Formerly the bulk of the copra was taken by the United States, and a proportion of the other exports went to Australia. Owing, however, to the development of French interests and the decline of British during recent years, coupled with French tariff preferences and the relatively favourable freight rates offered by Messageries Maritimes, nearly all exports now go to France (Fig. 182). In 1938 France took 99 per cent. of the copra, 99 per cent.

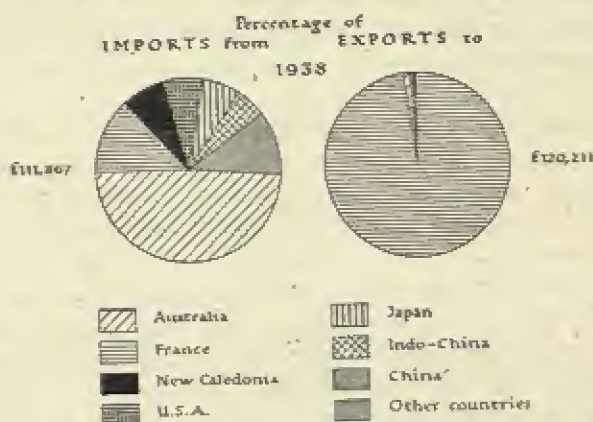


Fig. 182. External trade of the New Hebrides, 1938

Based on: (1) *Colonial Office Annual Report* for 1938 (London); (2) *New Hebrides Condominium Gazette* for 1939 (Vila).

of the coffee, and 100 per cent. of the cocoa. The small export of marine products (£1,350) was taken in roughly equal proportions by France and Australia; wool (£331) and hides (£357) went to Australia; and of the sandalwood (£1,215) the bulk was taken by China.

Imports are typical of those for a Pacific islands community. In 1938 the largest items (with their approximate values) were: petroleum products (£10,700); building materials (£9,600); rice (£8,500); sacks (£5,300); tinned meat and fish (£4,500); beer, wines and spirits (£3,800); tobacco (£3,500); flour (£3,100); sugar (£2,500). Nearly half the total came from Australia.

Notes issued by the New Caledonia subsidiary of the Bank of

Indo-China and by the Bank of France, together with United Kingdom and Australian silver, have formed the normal currency of the New Hebrides. There are no banks in the islands. The commercial houses do their banking in New Caledonia or in Australia and themselves act as bankers for many of the settlers.

PORTS AND SETTLEMENTS

VILA (Fig. 183; Plates 87-90)

Vila (lat. $17^{\circ} 44' S$, long. $168^{\circ} 19' E$), in the south-east of Efate, is both the administrative and commercial capital of the New Hebrides. It is the sole port of entry for the group. Europeans first settled in the neighbourhood about 1870. After 1882 it became the local headquarters of the French *Compagnie Calédonienne des Nouvelles-Hébrides*; and from this time it attained supremacy as a centre of European activity. In 1895 the settlers, with the active support of the municipal council of Noumea, formed at Vila a municipality, to which they gave the name of Franceville. It was, however, dissolved shortly afterwards, as being an infringement of the Anglo-French Convention of 1887. Renewed efforts to establish municipal government were made in the early years of the condominium, but they failed to win official support. Vila has remained under the direct administration of the condominium government. The present population is probably between 1,000 and 1,500. It includes from 250 to 300 Europeans and mixed-bloods, a number of Chinese and Japanese (mainly small traders and market gardeners), Tonkinese labourers, and New Hebrides natives.

The Port

Vila harbour is on the east side of Mele bay. It is a roughly oval stretch of water, about $1\frac{1}{2}$ miles from north to south and 1 mile from east to west, with a general depth of between 15 and 30 fathoms. The southern half is cut in two by the long narrow islet of Iririki, 170 ft. high and covered with trees. The harbour is protected to the south, east and north by hills, which descend at many points fairly steeply to the shore. It is partially enclosed on the west by Vila island, between which and the southern shore there is a reef almost awash. Good protection is thus given from prevailing winds, and even during strong westerlies—when parts of the harbour are exposed—sheltered anchorage can be obtained in the lee of Vila island.

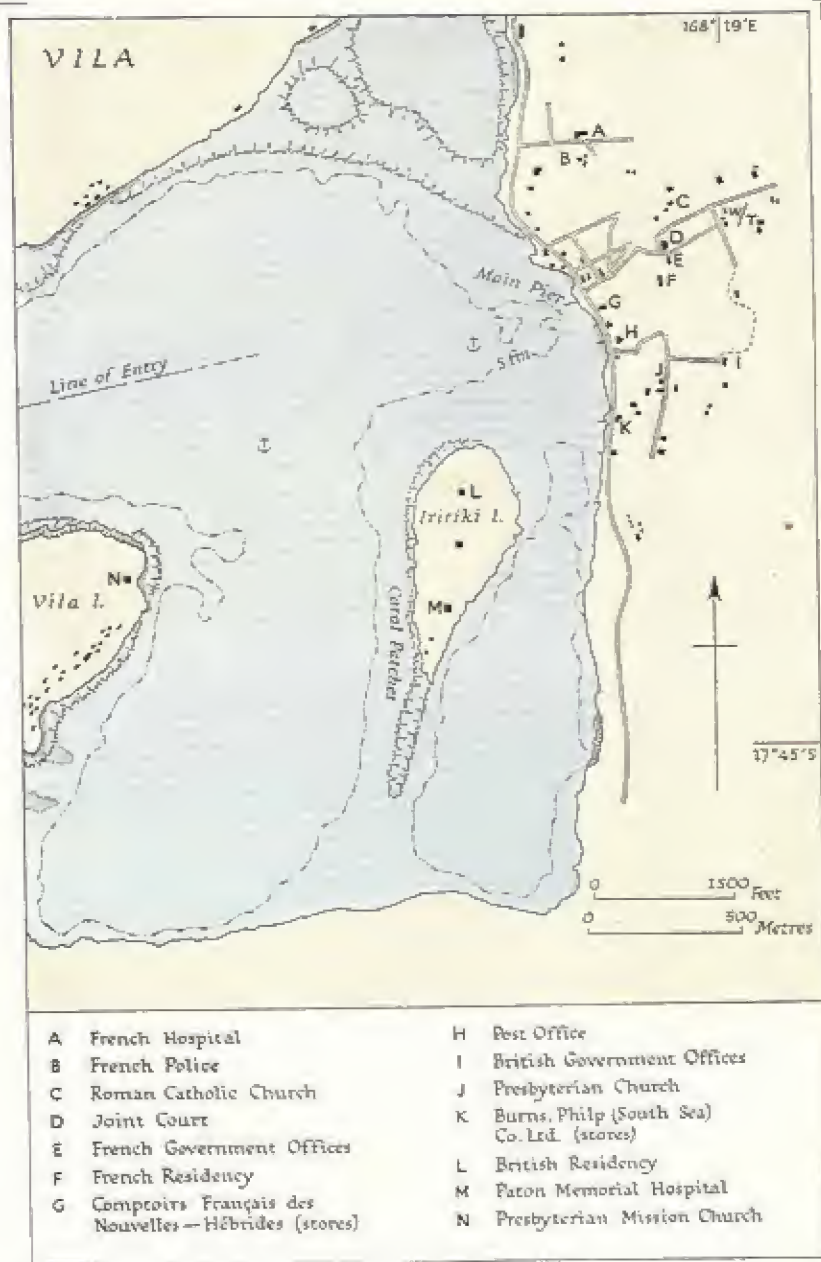


Fig. 183. Vila

Based on: (1) Admiralty chart no. 1637; (2) other official sources.

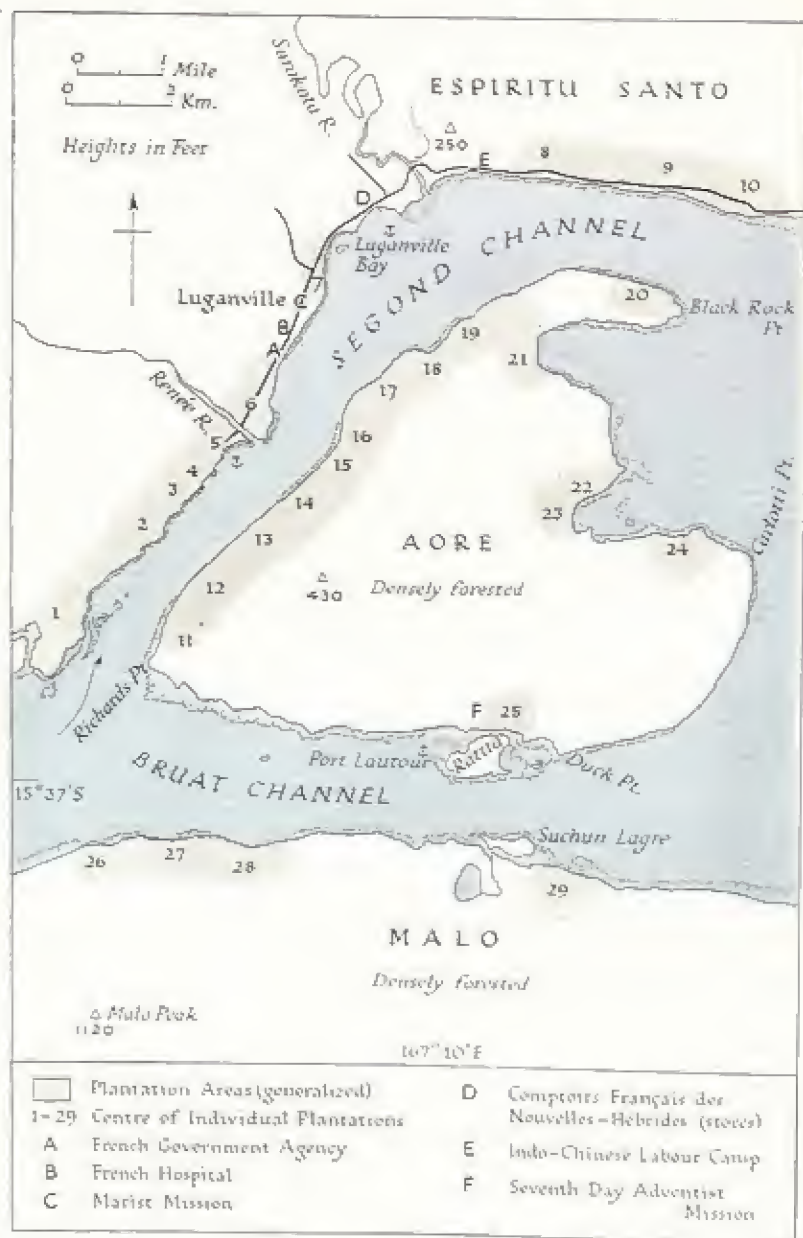


Fig. 184. Second and Bruat channels

Based on: (1) Admiralty chart no. 1487; (2) French *Service Hydrographique de la Marine* chart no. 4867; (3) other official sources.

The entrance for ships lies between Vila island and Malapoa point, to the north of it. The channel is about 450 yd. wide between 5-fathom lines, and the line of entry is marked by leading lights on the opposite shore. The best anchorage for all classes of vessels is about 550 yd. north-east of Vila island, on a patch of 10-12 fathoms, with a bottom of sand and coral. There is an alternative anchorage, in 12 fathoms, about 450 yd. from the eastern shore of the harbour and slightly to the south of the leading line. The northern arm of the harbour is used by small craft, but it is inaccessible to larger vessels because of the reef across its entrance.

There are no wharves but several piers, owned by the government and by business firms. The two largest of these are each about 240 ft. long and 8 ft. wide, constructed of stone and concrete blocks joined by wooden planking. Depth of water alongside is from 6 to 8 ft. In 1942 four launches and four lighters (ranging in capacity from 20 to 80 tons) were available for handling cargo. The only lifting appliances are small hand-derricks. There are a number of warehouses situated on the waterfront; and several of them are connected to neighbouring jetties by trolley tracks. No supplies of coal or oil are kept. Repair facilities are lacking. Fruit, vegetables, fresh meat and other provisions can be obtained in small quantities; there are no facilities for the supply of water to ships.

The Town

The town of Vila stretches for about a mile along the eastern side of the harbour. The main road follows the line of the foreshore, and along it are the premises of the principal business firms. From this road others branch off, ascending the slopes of the hills behind, where the offices of the government and of the British and French national administrations, together with many European dwelling houses, are situated. The British Residency is on the islet of Iriiki. The principal native settlement in the vicinity of the town is on Vila (more correctly, Fila) island.

There are two hospitals. The Paton Memorial Hospital, controlled by the Presbyterian mission, is on Iriiki; and the French government hospital is at the north end of the town (p. 557). At the French Residency there is a public library and a lecture room. Apart from these facilities, Vila is not well provided with social services or civic amenities. There is no drainage system or water supply, although shortly before the war the damming of the Tagabe river for this purpose was under discussion. In 1939 an agreement

was made with a Noumea firm for the installation of a public electricity system.

Vila is connected by road (Fig. 185) with the plantation areas of Mele bay and the Teuma river, and with Pango point and the Erakau lagoon—the latter being a popular bathing place and possible sea-plane base. There is a local telephone system in Vila, with extensions to the nearer plantations. The condominium W/T station (p. 572) is situated near the crest of the hill behind the town; its masts are a conspicuous landmark.

SECOND CHANNEL (Fig. 184)

Second channel (in approximately lat. $15^{\circ} 32' S$, long. $167^{\circ} 10' E$), lying between the south-eastern shores of Espiritu Santo and the off-lying island of Aore, provides one of the largest and best anchorage areas in the New Hebrides. Along both banks of the channel there are scattered plantations, while on the Espiritu Santo side is the French settlement of Luganville. Next to Vila, this is the most important centre of European commerce and settlement in the group.

Anchorage

Second channel extends for about 9 miles in a generally north-easterly direction from Richards point to Black Rock point. It varies in width from $\frac{1}{2}$ to $1\frac{1}{2}$ miles. The northern entrance is about a mile wide and free of obstructions; the width of the southern entrance is only about 600 yd., owing partly to off-lying reefs which fringe both shores for about a mile. Within the channel there are few dangers apart from spits of sand or shingle stretching for distances of up to 500 yd. from the mouths of the several rivers. The depth of water in mid-channel is generally between 20 and 30 fathoms, though there are several areas with between 10 and 20 fathoms.

During one week's observations maximum current recorded was 0.75 knots at the eastern end of the channel and 2.80 knots at the western end; this is probably below the maximum experienced under certain weather conditions.

The most used anchorage is in Luganville bay. Here there are two piers—one, owned by the Compagnie Française des Nouvelles-Hébrides, being equipped with a crane. Launches are available. Ships anchor in the northern part of the bay, at about 400 yd. from the shore, in 9-10 fathoms, on a bottom of sand and mud. Other good anchorages are situated to the north and south of the mouth

of the Renée river—the former in 16 fathoms, on mud; the latter (Dart anchorage) at about 500 yd. from the river mouth and 300 yd. from the shore, in about 10-12 fathoms, on a bottom of sand. Equally-satisfactory anchorage is almost certainly obtainable, however, in other less used parts of the channel. At several plantations there are small piers.

Settlement

Luganville, situated on gently rising ground to the west of the Sarakata river, is the headquarters of the French agent for the northern district of the condominium administration. A French hospital, for Europeans and non-Europeans, is placed nearby. There is also a Marist mission station, and there are several French stores, including that of the Compagnie Française des Nouvelles-Hébrides, and a privately-owned W/T station. Just to the east of the settlement is a well-equipped engineering workshop, capable of undertaking welding, and a boat-building yard. Luganville is the centre of the most extensive settled area in the New Hebrides (p. 585). The British government agency for the region is on the islet of Venui.

COMMUNICATIONS

Sea Communications

The New Hebrides has for long depended for its main shipping services upon two companies—the French Compagnie des Messageries Maritimes and the Australian firm of Burns, Philp and Company. Until the war the former maintained a two-monthly service between French ports and Noumea, in New Caledonia, calling at Vila *en route*, and another service from Vila to Sydney, *via* Lifu, in the Loyalty islands, and Noumea. From time to time it ran a vessel between Vila and Indo-China, primarily in connection with the importation or repatriation of Indo-Chinese labourers. The latter company maintained a five-weekly service from Sydney, *via* Lord Howe and Norfolk islands, to Vila. From Vila the vessel normally made a round of the other principal centres of European (and more especially British) enterprise, such as Bushman's bay (p. 580) and Segond channel, before leaving the group. The companies received subsidies from the French and Australian governments respectively for the carriage of mails. In addition, Vila was visited at intervals of about 2½ months by ships of the Dutch K.P.M.

Line engaged in the service between Saigon, in Indo-China, and Australian and New Zealand ports.

Both Messageries Maritimes and Burns, Philp operated local services within the group. These were not run to a definite itinerary, but normally vessels visited the principal plantations, trading centres and mission stations at intervals of from 4 to 5 weeks. They carried mails and cargo and themselves functioned as a kind of floating store. In addition, a large number of locally owned cutters and launches were run by traders, planters and missionaries.

Land Communications

There are no railways in the New Hebrides, but a 2-ft. track, used by trolleys, runs from the outskirts of Mele to Vila, a distance of about 4 miles. Trolleys similarly run from the main piers at Vila to the bulk storehouses.

Until recently public roads suitable for motor traffic were few and mostly in poor condition. On Efate, short stretches running out from Vila had a total length of about 30 miles (p. 570; Fig. 185). There were also several roads in the Segond channel area of Espiritu Santo (Fig. 184), on Tana (Fig. 198), and on Tongoa. In many other areas private roads existed on plantations. Some of these were usable only by ox-waggons, but many were used by motor vehicles. In 1938 there were about 70 motor vehicles in the group.

Air Facilities

Before the present war the New Hebrides had no air communications, and there were no facilities for aircraft. Erakau lagoon (Fig. 185), near Vila, and many of the larger anchorage areas—including Vila and Havannah harbours (in Efate) and Segond channel and Hog harbour (in Espiritu Santo)—have stretches of water, however, on which seaplanes and flying-boats could alight.

Signal Communications

There is a public telephone system in Vila, with lines running to outlying plantations. The number of telephones is between 60 and 70. The condominium government has a W/T station at Vila, which operates on short-wave and on the 600-metre band. It maintains daily schedules with Noumea and Suva and also communicates, less regularly, with other Pacific stations. There are private W/T stations at Luganville (Espiritu Santo), Norsup (Malekula), Lenakel (Tana) and other places; several receive subsidies.

(For Bibliographical Note see Chapter XIV.)

Chapter XIV

INDIVIDUAL ISLANDS OF THE NEW HEBRIDES

Efate: Malekula: Espiritu Santo: Shepherd Islands: Epi: Paama and Lopevi: Ambrim: Raga and Maewo: Omba: Banks Islands: Torres Islands: Southern Islands

Matthew and Hunter Islands

Bibliographical Note

The islands of the New Hebrides fall geographically into several groups. These are: (i) the three largest islands, Efate, Malekula, and Espiritu Santo, which with their off-lying islands form the western arm of the New Hebrides proper; (ii) the islands from the Shepherd islands to Maewo and Omba, which form the eastern arm; (iii) the Banks islands; (iv) the Torres islands; and (v) the southern islands, between Aneityum and Eromanga, which though usually regarded as part of the main group, have certain characteristics of their own and are separated from Efate, the nearest island to the north, by a wide stretch of sea. This order is followed in the treatment of this chapter, and within each grouping the islands are described successively from south to north.

The chapter ends with a description of the isolated islands of Matthew and Hunter, which do not form part of the New Hebrides but are approximately equidistant from the southern islands of the group and from the Loyalty islands.

EFATE

Efate (lat. $17^{\circ} 44' S$, long. $168^{\circ} 19' E$, at Vila) is about 30 miles long from east to west and about 21 miles in greatest width (Fig. 185). It is known to the French as Ile Vaté and was formerly known to Europeans generally as Sandwich island.

PHYSICAL GEOGRAPHY

Efate is of volcanic origin but almost completely encrusted with coral limestone (Fig. 167). In the north are beds of coarse agglomerates overlaid by pumice tuffs and by 'soapstones' similar to those of Fiji (p. 115); the oldest rocks in the south are the tuffs and soapstones. Later volcanic activity has penetrated these beds with intrusions of andesite and basalt lavas in many areas and has formed

the off-lying islands of Nguna, Emau and Pele. (The islands of Eradaka, Lelepa and Verao, off the north-west coast, were apparently formed earlier and have a foundation of soapstone overlaid by coral limestone.) Limestones occur up to the summits of the highest hills,



Fig. 185. Efate

Based on: (1) Admiralty chart no. 1637; (2) *Proceedings of the Linnean Society of New South Wales*, vol. XXX, plate xxviii (Sydney, 1905-06); (3) various official sources.

but seldom form a crust more than 50 ft. thick. The rivers have cut through the limestone to the soft soapstone beneath and thus eroded much material, which has been re-deposited to form alluvial flats in their lower reaches.

A sharp-crested mountain chain follows the north-west coast a

few miles inland. The highest peak, mount Macdonald, is 2,203 ft. high. Several lesser ridges buttress the main ridge on the south. The southern part of the island is a plateau 200-300 ft. high intersected with coral ridges dipping gently to the south-east. The porous coral soil absorbs much of the rainfall. The whole island is densely wooded except for the peninsula north-west of Mele bay, which is largely covered with coarse grass.

Coasts, Anchorages and Landings

The coasts of Efate reflect the structure of their adjacent hinterlands. In the north and west, near the mountain ranges and centres of former volcanic activity, they are rugged, with large promontories and wide bays. The southern and eastern coasts, bordering the low coral plateau, are generally featureless, with few indentations. There is a continuous and narrow fringing reef on the north, east and south coasts and isolated patches of reef on the west and north-west coasts. The islands of Eradaka, Lelepa and Verao, off the north-west coast, are hilly, but the highest point (on Lelepa) reaches only 637 ft. The islands of Nguna, Pele and Emau, off the north coast, are much higher. The main peak of Nguna, Tavanaki, reaches 2,013 ft., and the highest point on Emau is at 1,492 ft.; both islands contain craters.

Of the anchorages, Vila harbour (p. 568) and Havannah harbour are outstanding. Havannah harbour, enclosed on the seaward side by the islands of Lelepa and Verao, is a large expanse of water with two main entrances. Hilliard channel between Lelepa and the main island has a least navigable width of 1,000 yd. and is very deep; a small patch of reef on the southern shore is the only danger. Little entrance between Lelepa and Verao carries a least depth of 6 fathoms in mid-channel. Depths within the harbour are mostly from 40 to 60 fathoms. The best anchorage is in 16 fathoms on sand in Matupu bay, an indentation in the Efate shore.

Undine bay, to the north of Havannah harbour, between the mainland and the islands of Nguna and Pele, has for the most part great depths, but anchorage is possible in 11 and 6 fathoms off the north-western and southern extremities of Nguna respectively. Metensa bay on the east coast of Efate provides good anchorage for small craft in 5-8 fathoms on a sandy bottom but is exposed to north and east winds. South bay on the south coast is of similar size and suitable for anchorage except in south and south-west winds. Mele bay is so deep and exposed that the only suitable area for anchorage is between Mele island and the northern shore of the bay.

SOCIAL AND ECONOMIC CONDITIONS

In 1938 the population of Efate and its off-lying islands comprised about 2,000 natives, 500 Europeans, over 100 Chinese and Japanese, and some hundreds of Tonkinese. The majority of the Europeans and of the Chinese and Japanese were in or near Vila (p. 568), the administrative and commercial centre of the New Hebrides. The Tonkinese were almost all working on French plantations. The natives were mainly living in scattered coastal villages; several hundreds were in the off-lying islands.

The principal stations of both the Presbyterian and Marist missions are in Vila, but the Presbyterian mission has also a station on Nguna. The most important plantation areas on the island are on the north-east of Mele bay and between Vila and the Teuma river; these are connected with the town of Vila by road. There are other large plantations at Metensa bay, in the east of the island, and in Palao bay and Havannah harbour.

MALEKULA

Malekula, known to the French as Mallicollo, lies between lat. $15^{\circ} 53'$ and $16^{\circ} 35'$ s and long. $167^{\circ} 09'$ and $167^{\circ} 50'$ E. It is the second largest island in the group and is about 59 miles long and from 5 to 20 miles in breadth. Only the south and east coasts have been surveyed, and much of the interior is still very imperfectly known to Europeans.

PHYSICAL GEOGRAPHY (Fig. 186)

Malekula is formed of Miocene marine tuffs and limestones, which have subsequently been penetrated over limited areas by andesite lava. The north-western part of the island and some areas on the east coast are overlaid by recent coral limestone up to heights of 1,000 ft. The beds of older tuffs and limestones have been maturely eroded, so that they now form a complex of low ranges with gently rounded profiles; thick deposits of alluvium have been washed into the intervening valleys. Mount Penot (2,925 ft.) is the highest of several peaks between 2,000 and 3,000 ft. high. In the north-western part of the island the recent coral terraces have produced an undulating landscape, with low, flat-topped hills.

The drainage system is well developed. The largest stream is the Pangkumu which forks near its mouth; one branch rises near mount



Plate 89. The south end of Vila

A view from near the British Residency, on Iririki, looking towards the mainland shore immediately opposite.



Plate 90. A coconut plantation at Vila

A view from Iririki, looking further south than Plate 89.



Plate 91. Marau sound

The large anchorage area at the eastern end of Guadalcanal, protected by off-lying islets.



Plate 92. The Segilau river, Guadalcanal

The river, which here flows through a coconut plantation, contained little water at the time of the photograph, but the broad belt clear of trees on either bank gives an indication of its size in time of flood. The mouth is blocked by a sand bar.

Penot, the other near mount Goodenough. The Ureymus which drains the south-western part of the island is the only other major stream.

Vegetation is everywhere dense. In the southern and central parts it is mostly thick forest, matted together by numerous lianas and creepers. In valleys such as that of the Pangkumu are extensive swamps, the haunt of numerous wild duck and pigeons. The coral terraces in the north are covered with cane grass.

Coasts, Anchorages and Landings

The coasts of Malekula possess numerous small indentations. Fringing coral reef is well developed along most of the south and east coasts, where it also occurs in large detached patches and around off-lying islands. It is poorly developed on the west coast. The off-lying islands from Vao to Uri on the north-east coast are raised fragments of an ancient reef. They are thus fairly flat-topped and of a relatively uniform height (from 100 to 150 ft.). The islands off the south and south-east coasts, including Sakau, Kuliviu and Wulei, are of different character and origin. They appear to be composed of a hardened volcanic mud and have an irregular profile with hills and ridges rising to over 300 ft. The coast of Malekula itself is seldom uniform in type for more than a few miles. Where the ranges of hills reach the coast, as in parts of the south-east, there are numerous low, cliffed points alternating with sandy beaches. Midway along the east coast, near Bushman's bay and Port Stanley, the hills are further inland and the coastal belt of low plain ends in a mangrove-fringed shore. At the northern end of the island, the elevation which raised the limestone-encrusted coastal ranges has apparently continued until recent times, for fringing reefs have not developed in the shallow water inshore. The west coast has not been adequately surveyed, but appears to have a continuous narrow fringe of reef, mostly sunken. The short stretches of cliff which occur, particularly at the promontories, frequently contain caves. The sandy beaches are laying-grounds for turtles and megapodes. In general, wherever there is raised limestone on the coast, the nearby beaches tend to be of white sand. Elsewhere, in the vicinity of volcanic rocks, the sand is frequently black. Some beaches on the east coast are covered with pumice which has been carried by the currents from Ambrim.

Many of the numerous indentations are suitable for anchorage, but only a few are regularly used. Port Sandwich, in the south-east of the island, is probably the best anchorage in the group. It is

sheltered in all winds and has good holding ground on a mud bottom. It is a winding inlet about $4\frac{1}{2}$ miles long and varying in



Fig. 186. Malekula: physical

Owing to lack of survey of the interior, ridge trends and other elements of relief are shown only approximately. Based mainly on: (1) Admiralty charts nos. 1579, 1913; (2) *Geographical Journal*, vol. LXXXVIII, pp. 98, 104, 338 (London, 1936).

width from $\frac{1}{2}$ to $\frac{3}{4}$ mile; it trends in a generally north-east and south-west direction. The entrance between Ashuk head (596 ft.) on the

anchorage in Middle bay on the west coast, in 14-15 fathoms, and near Planter point on the opposite coast. At Planter point there is a stone pier.

Bushman's bay, about midway along the east coast, is a deep bight a mile wide. There is fringing reef on each side of the entrance; at the head of the bay there is a sandy beach. Good anchorage can be obtained anywhere near the head of the bay. It is a regular place of call for steamers. Other good anchorages of similar type on the east coast include Sasun, Tesman, Pangkumu and Sarmet (Meadus) bays, north of Port Sandwich. Sasun and Pangkumu bays are well protected from the prevailing south-easterly winds. Port Stanley on the same coast is protected by a long promontory and by the islands of Uri and Uripiv, but has too great depths to be considered a good harbour; the best anchorage is in 12 fathoms close to the southern shore of Uri island. Norsup bay, north of Port Stanley, affords good anchorage in 10 fathoms at its head.

On the west coast the only anchorages of importance are Lambumbu harbour and South-west bay. The former is a narrow inlet fringed with coral and backed by high sandstone cliffs. It has depths varying from 13 to 15 fathoms. South-west bay is a wide, shallow bay protected from the south-west by West point and a tongue of reef. Sheltered anchorage in moderate depths may be obtained almost anywhere within the bay.

SOCIAL AND ECONOMIC CONDITIONS (Fig. 187)

The population of Malekula has greatly decreased during the last hundred years, and in most parts of the island the decline appears to be still continuing. It is still, however, the most populous island in the group. Together with that of off-lying islands, the native population was estimated in 1936 at about 11,350. There are also some hundreds of Tonkinese and probably between 50 and 100 Europeans.

European enterprise is very largely confined to the east coast. There are a number of plantations, nearly all under French control, at Port Sandwich, Sarmet bay, and Norsup bay. At Bushman's bay there are several British plantations. The British and French government agencies for the Central District, No. 2, are at Bushman's bay and Port Sandwich respectively. There is a French government hospital at Norsup and a dispensary at Port Sandwich. The Marist mission has stations, each normally under the control of a European priest, at Vao, Wala and Port Sandwich. The Presbyterian mission

has a station at South-west bay, and has (or had until recently) another on Hambi island. The Seventh Day Adventist mission is also at work on the island, mainly among the people of the coastal districts in the north.

In the interior, owing to the roughness of the country and to the frequently unfriendly relations between neighbouring tribes, communications are poor. In most parts of the island the people form small autonomous communities, living in groups of contiguous hamlets. The plateau westward of Norsup, however, is inhabited by a more highly organized community, known to Europeans as the Big Nambas (so named from the size of the penis case—the *nambas*—worn by the males). These people number over 2,000, of whom nearly half live in the principal village of Amok; they have a well-developed system of chieftainship; and they form themselves at need—whether to resist a labour recruiter or a government patrol—into a well-armed and effective fighting force.

ESPIRITU SANTO

Espiritu Santo lies between lat. $14^{\circ} 39'$ and $15^{\circ} 40' \text{ s}$ and long. $166^{\circ} 34'$ and $167^{\circ} 15' \text{ E}$. It is the largest island in the New Hebrides, having a greatest length from north to south of about 70 miles and a greatest breadth of 37 miles (Fig. 188). It is known locally simply as Santo, and was formerly often called Marina, a name properly applying only to a district in the south-east.

PHYSICAL GEOGRAPHY

Espiritu Santo consists of two widely different regions. The eastern half of the island is largely a plateau of raised coral limestone, of a general elevation of between 300 and 600 ft., the only considerable height in this region being mount Turi (1,760 ft.). Towards the coast it is terraced, and in the west rivers such as the Yora have cut deep cañons through it. The islands off the south and east coasts are of similar formation. The western half of the island, by contrast, is very mountainous, rising to 5,566 ft. at Laiiriiri (Santo peak) and to 6,195 at mount Tabwemasana.

The drainage system is well developed. The largest river is the Yora (named by Quiros the Jordan and for long so known), which rises near Laiiriiri and flows north-eastward to St Philip and St James bay. Many other rivers rise in the main range and either flow as swift streams, with many cataracts and waterfalls, to the west

coast or enter the limestone plateau and flow more slowly towards outlets on the north or south coasts.

Unlike Efate and Malekula, Espiritu Santo has no large areas of grassland. Except for the sites of villages, gardens and plantations, almost the whole island is covered with dense rain forest.

Coasts, Anchorages and Landings

Most of the west coast, which is largely unsurveyed, is precipitous, with the mountains rising abruptly from the sea. Fringing coral is almost completely absent, and there are hardly any marked promontories or indentations. The south coast has more varied features, being a succession of wide bays with beaches of white or black sand, backed by a coastal plain. Off the coast is a group of islands, the largest of which are Malo, Aore and Tutuba (p. 584). Araki island, farther west, is flat-topped, with a profile like a flat-brimmed hat when viewed from the south. The small island of Tangoa, close inshore, marks a change in the coastline. From there to the western entrance to Segond channel (p. 570) the coast is rocky, with off-lying rocks and many small indentations and a narrow fringing reef. The east coast has a chain of raised coral islands lying off it from Sakau in the north to Aesi and Palikulo in the south. The coast itself is backed by low terraced hills. Recent fringing reef is very slightly developed. There are five major indentations—Palikulo, Turtle and Shark bays, Hog harbour and Port Olry. The north coast contains the large and deep bay of St Philip and St James (known locally as Big bay). Its western shore is formed by the west coast range, which at cape Cumberland, the north-western extremity of the island, falls to a low tongue of land. Its eastern shore is the northern end of the great coral limestone plateau, which falls gradually in terraces to cape Quiros, the north-eastern point of the island.

Many of the bays and indentations on the coast are suitable for anchorage. Segond channel, between Espiritu Santo and Aore, is by far the most used. Palikulo bay, sheltered from the east and south-east by a peninsula and by Palikulo island, has numerous coral heads and shoals near its head. The entrance through Diamond passage, between Aesi and Palikulo islands, is clear, and anchorage can be obtained in 16 fathoms to the west of Palikulo island. In Turtle bay, 10 miles to the north of Palikulo, there is anchorage in about 10 fathoms towards the head of the bay. Shark bay, 10 miles farther north, is of similar proportions with anchorage in 16 fathoms on bad holding ground. Hog harbour is open to the north. Dividing the



Fig. 183. Espiritu Santo

Owing to lack of survey of the interior, ridge trends and other elements of relief are shown only approximately. The tribal names shown are those only of the better known peoples of the island. Based on: (1) Admiralty chart no. 179; (2) *Geographical Journal*, vol. LXXXV, p. 304; vol. LXXXVIII, p. 245.

entrance into two is Elephant island (660 ft. high). Except for two small patches of reef, the bay is free from dangers. It shoals gradually towards its head, known as Lonock bay, where there is sheltered anchorage in 14 fathoms. Port Olry, north of Hog harbour, is a narrow inlet sheltered by Dolphin island. A chain of rocks obstructs the channel to the south of the island; the passage to the north of Dolphin island is free from obstructions and leads to anchorage in 10-16 fathoms. St Philip and St James bay has few areas suitable for anchorage owing to its depth. Table anchorage, on its south-east side, has good holding ground in 9-11 fathoms; and at Talomako, near the mouth of the Tawoli river, there is a small anchorage area with a depth of 12 fathoms on sand. The only good anchorage known on the west coast is just to the north of cape Lisburn, where, on a gently shelving beach, anchorage for small vessels can be obtained in 7 fathoms with good shelter from east winds. On the south coast, between Tangoa island and Annand point on the mainland, Tangoa anchorage has depths of 12 fathoms on sand and mud. There is a small pier on the island opposite the anchorage. Baldwin cove, on the rocky coast east of Tangoa, is sheltered by a chain of islets and reefs and offers several areas suitable for anchorage.

Malo, the largest of the off-lying islands, is about 12 miles long from east to west. It is a raised plateau of coral limestone 300-400 ft. high, on the western end of which are two peaks 980 and 1,120 ft. high respectively. Malo peak, the higher, is prominent from all sides but the south-east. The whole island is densely wooded. The coast is mostly cliffed, with a narrow fringing reef; off the south-east coast are the three small islets of Malokilikili.

Aore, separated from Malo by Bruat channel and from Espiritu Santo by Segond channel, is a triangular island about 7 miles from east to west. It is composed of raised coral limestone and is densely wooded. There are considerable stretches of fringing reef on all coasts. Port Lautour, off the south coast, is sheltered from all but westerly winds. Tutuba, about 2 miles to the east of Aore, is a heavily wooded island of raised coral, 240 ft. high at its south-western end. Midway between it and the east coast of Aore lies Bogacio islet.

SOCIAL AND ECONOMIC CONDITIONS

During the past fifty years depopulation has been heavier in Espiritu Santo than in almost any other part of the New Hebrides (p. 536).

The present native population is variously estimated at between 4,000 and 7,000, with an additional 600 to 1,000 on the off-lying islands. There are, further, some hundreds of Tonkinese, nearly all of whom are living on French plantations; and about 250 Europeans.

The south-east coast of Espiritu Santo and the adjacent islands of Aore and Malo constitute one of the most important regions of European settlement in the group. Along both shores of Segond channel, which separates Aore from the mainland, there are almost continuous stretches of plantations, and on the mainland shore is the French administrative, commercial and missionary centre of Luganville (p. 571; Fig. 184). There are other plantations—in general, less close to one another—on the south coast of Espiritu Santo for some miles to the west of Segond channel, on the east coast as far north as Turtle bay, and round the coasts of Malo. The French government agency for the Northern District is at Luganville and the British agency is on Venui islet. There is a Marist mission station at Luganville; a Presbyterian mission station and school on Tangoa and another station at Abpetare, on Malo; and the local headquarters of the Seventh Day Adventist mission at Port Lautour, on the south coast of Aore.

The British government agency was formerly at Hog harbour, in the north-east of the island, where there is a Presbyterian mission station and a large coconut plantation, which is (or was at least until recently) British owned. At Port Olry, to the north of Hog harbour, there is a Marist mission station and a French-owned plantation, and in St Philip and St James bay two British-owned plantations. On the west coast, the Presbyterian mission formerly had an important station at Wus, about 3 miles north of the mouth of the Vakola river, but with the decline of the population this has been left to a native teacher with only infrequent supervision by a European missionary.

SHEPHERD ISLANDS

The Shepherd islands are a group of seven small islands and islets, with numerous reefs and banks, which extend 14 miles south-eastwards of Epi. With them may be included Ermae, Makura and Mataso, situated between them and Efate. All these islands are of volcanic origin, devoid of later limestone deposits. Coasts are mostly steep-to. They consist of low, rocky cliffs interspersed with beaches of black lava pebbles and boulders. Vegetation is less dense than on many of the larger islands and is rich in trees and shrubs with brightly coloured leaves. The native population, unlike that of most parts of the New Hebrides, is now either static or increasing in numbers in nearly all the inhabited islands.

TONGOA

Tongoa (lat. $16^{\circ} 54' S$, long. $168^{\circ} 33' E$) is the largest of the Shepherd islands. It is about 6 miles long and 3 miles wide. There are several hills; the highest reaches 1,674 ft. The only sign of recent volcanic activity is in an area on the north side where the ground is heated to almost $212^{\circ} F$. In 1897 a submarine eruption occurred between the island and Epi. The coast is steep-to, with high cliffs alternating with beaches of black sand.

In 1936 the native population was 1,450. It is increasing, and overcrowding has been regarded as an imminent possibility. To prevent it the condominium government in 1940 prohibited the sale of any land on the island to non-natives. The people are relatively advanced socially and economically. Quite a good road traverses the island. There has for many years been a Presbyterian mission station on Tongoa.

TONGARIKI

Tongariki (Fig. 189), about 6 miles south-east of Tongoa, is the second largest island in the group. It is about 2 miles across, 1,687 ft. high, and thickly wooded. The coast, which is steep-to, is formed of boulders and volcanic rocks, with a few

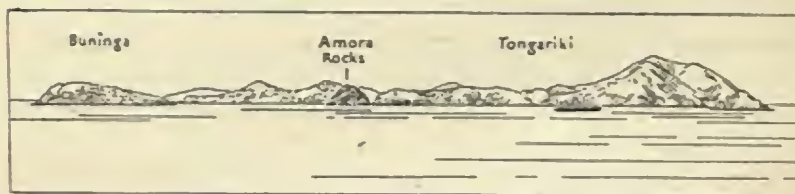


Fig. 189. Tongariki and Buninga: profile from the south-east

Tongoa can be seen in the background, between Amora rocks and Buninga. Based on a photograph.

beaches of black sand. Anchorage is possible in 12 fathoms off the north-western side. In 1905 the population was 226; it has probably remained fairly stable during the succeeding forty years.

OTHER ISLANDS

Buninga, the south-western island of the group, lies about a mile from Tongariki. It is roughly circular in shape, about a mile in diameter, and rises to a height of 723 ft. It is thickly wooded. The people, about 100 in number, live in a village near the summit of the island. Between Tongariki and Tongoa lie the two small islands of Falea and Iwose. The latter is inhabited, and anchorage can be obtained off its lee side in 11 fathoms. About 2 miles north of Tongoa is the islet of Laika. It has two hills, the higher of which rises to 352 ft. A promontory projecting north-eastwards protects a sandy beach on the west side, where landings can be made. Laika is not permanently inhabited, but is visited frequently by the people of Tongoa. About a mile north-west of Laika is the smaller islet of Tevala.

EMAE

Emae, also known as Three Hills island, lies about ten miles south-west of Tongoa. It is about $5\frac{1}{2}$ miles long from east to west and about $2\frac{1}{2}$ miles broad. It derives its English name from the three hills which it contains. Maunga (2,171 ft.), at the

eastern end, is the highest. The island is thickly wooded. The coast is fringed with coral. An open roadstead south of Sesaki point on the west coast provides good anchorage in 10 fathoms. The people live in seven villages. The population of Emae and its neighbouring islands together amounted to 300 in 1936; probably rather more than half of these were on Emae itself.

MAKURA AND MATASO

Makura, about 5 miles south-east of Emae, is a volcanic islet about 1 mile long with a greatest height of 979 ft. and a coast that is bold and steep to all round. Anchorage can be had in 11 fathoms, about 400 yd. from the western end. Landing from boats is always made difficult by the swell. There is a small native population.

About 8 miles south of Makura is Mataso (Two Hills island), of similar size to Makura. The northernmost of its two hills rises to 1,643 ft. The coast, which is steep to on all sides, has small stretches of fringing reef on either side of a low isthmus connecting the two hills. Anchorage can be obtained in 14 fathoms off the southern side of the isthmus, where landing can be made through a gap in the reef. There is a native population of about 100. Wot or Monument rock, an inaccessible islet 397 ft. high, lies $1\frac{1}{2}$ miles to the east of Mataso.

EPI

Epi (lat. $16^{\circ} 42' S$, long. $168^{\circ} 15' E$, at Drummond bay) is about 25 miles long from north-west to south-east and between 2 miles and 10 miles broad (Fig. 190). It has sometimes been known as Tasiko, a name which properly applies only to a district in the south-east.

Physical Geography

Epi is predominantly of volcanic origin but contains extensive later marine deposits. These latter, which attain a thickness of 200 ft. at the Foreland, consist in their lower layers of a mixture of volcanic debris and marine fossils, and in their upper layers of solid coral limestone. The complicated system of peaks and ridges is the outcome of volcanic eruptions at at least two different periods. The mountains at the western end are older and considerably dissected by streams. Those in the centre and east, being newer, preserve their conical profiles; the highest point, mount Tava ni Kutali, is in the centre. The whole island is densely wooded.

The coast on south and west is a succession of sandy beaches and rocky points fringed with coral reef. On the north and east coast are several stretches of cliff overlooking boulder-strewn beaches. There are no real harbours; such anchorages as exist are all wide bays such as Diamond bay, exposed to heavy swell, or else narrow gaps in the shore reef opposite the mouths of streams. More sheltered anchorage, except in west winds, is obtainable in Nelson bay, Foreland anchorage and Ringdove bay on the west coast. Drummond bay on the north-east coast is large and well sheltered from the south and south-east; anchorage is in the eastern end in 7-12 fathoms.

Social and Economic Conditions

In 1916 the native population of Epi was 3,280, but by 1936 it was estimated to have fallen to 800. Though this latter figure may be somewhat too low, it is certain that a very large decline has occurred. This has been associated with the breaking up of traditional native ways of life, as a consequence of extensive European settlement on the island.

Europeans first settled on Epi between 1870 and 1880. By about 1906 plantations, then producing mainly maize and coffee, stretched along the west coast most of the way from Diamond bay to the vicinity of Lamén island. At Ringdove bay there was a trading station which served the natives of a large part of the central New Hebrides. The number of European residents on the island was about 60, of whom roughly three-quarters were French and one-quarter English; and new settlers were continuing to arrive. Epi stood second only to Efate as a centre of European enterprise. The change-over to copra and cocoa as main crops on European plantations in following years brought a growing prosperity to the island. The first Tonkinese labourers brought to the New Hebrides after the war of 1914-18 came

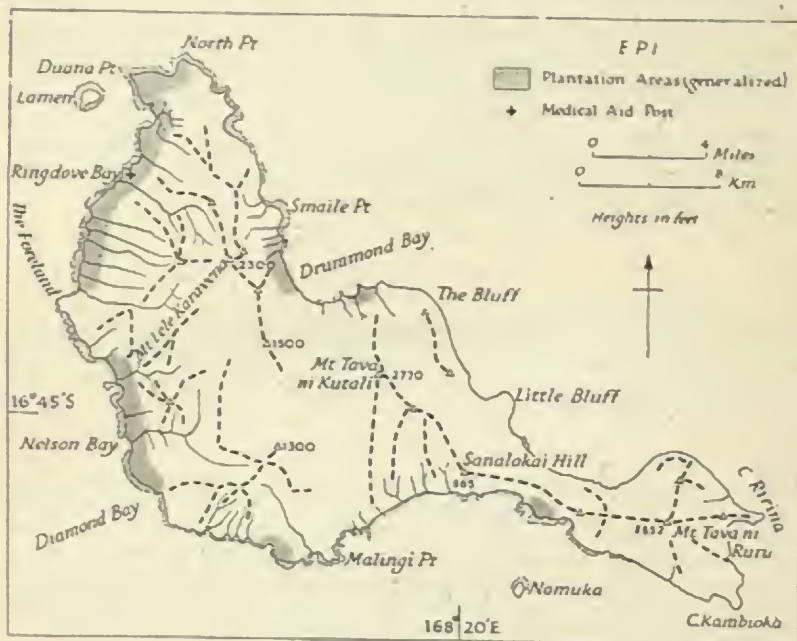


Fig. 190. Epi

Based mainly on: (1) Admiralty chart no. 2226; (2) *Nouvelles Hebrides: Carte comparative des influences françaises et anglaises en 1902* (Noumea, 1903).

to Epi. Later, the large numbers of the Tonkinese working on the island led to the establishment of a medical aid post at Ringdove bay, under the charge of an Annamite medical practitioner. Between 1931 and 1936, however, when low prices had already begun to place the planters in a difficult position, the island experienced six disastrous hurricanes. Many plantations had to be abandoned. In 1937 Epi, which had constituted a separate electorate (*circonscription*) for the French *Commission consultative* (p. 553), was merged in the electorate of Malekula, as only four voters remained.

Mission work among the native population has for many years been carried on by the Presbyterians, who have a station on the island.

PAAMA AND LOPEVI

Paama and Lopevi lie midway between the northern point of Epi and the south coast of Ambrim. They are both of volcanic formation.

Paama, sometimes known as Pau Uma, is 5 miles long from north to south and 2 miles across from east to west. A range of mountains rising to a general height of 1,500-1,800 ft. forms the backbone of the island. Good anchorage is obtainable about $1\frac{1}{2}$ miles north of Mary Stewart reef, a detached reef off the west coast. The island is fertile and healthy. The population has been increasing for many years past (p. 537). In 1936 it totalled about 2,000.

Lopevi, about 4 miles to the east of Paama, is a volcanic cone rising to a height

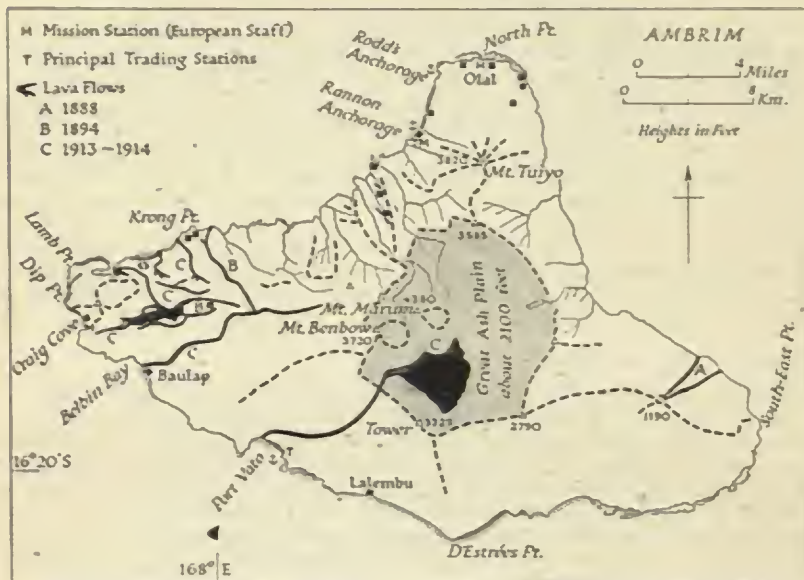


Fig. 191. Ambrim

Lava flows exaggerated in width. Based on (1) Admiralty chart no. 2225; (2) *Pacific Islands Year Book*, pp. 28-9 (Sydney, 1942); (3) R. Lamb, *Saints and Savages*, p. 204 (London, 1905).

of 4,755 ft., with a small crater at its summit. It is still active, and lava has been erupted several times within the past eighty years (p. 517). On the southern side is a small plateau where the inhabitants, numbering about 150, are living.

AMBRIM

Ambrim, 12 miles north of Epi, has a greatest length (roughly from east to west) of 27 miles and a greatest breadth (from north to south) of 18 miles (Fig. 191).

Physical Geography

The island is in origin the truncated cone of an immense volcano. The ancient crater, about 8 miles in diameter and filled with loose ash, occupies the centre of

the island. Round this ash plain the crater walls rise to heights of over 3,000 ft. above sea level. Several ridges containing parasitic cones radiate outwards from the crater rim. Within the caldera are mounts Benbow and Marum (3,720 ft. and 4,380 ft. high respectively), volcanic cones of more recent formation. Daughter cones on their slopes are continuously active, and there are occasional major eruptions (p. 516). The summits of the main peaks, including mount Tuiyo in the north of the island, are generally hidden in cloud. The drainage system is more fully developed in the northern part of the island. One stream has its origin in a small lake in the eastern part of the great ash plain and finds its way to the east coast through a gap in the crater rim.

Most of the south coast is backed by fairly level land and has few prominent features. Except for a few short stretches of low earthy cliffs, it is low-lying, with sandy beaches and moderate depths inshore. At the western end, between Craig cove and Krong point, there are more rugged features which have been greatly altered during the last fifty years by lava flows and earth movements. Cliffs are general. Between Dip and Lamb points they mark the coastline before the eruptions of 1913 and 1914. Elevation at that time and since has left them as much as $\frac{1}{2}$ mile from the present shoreline. The former harbour at Dip point was, by 1917, 10 ft. above sea level. The north-west coast as far as North point is more rugged with numerous small indentations and cliffed promontories. Round North point is a wide stretch of fringing reef. The north-eastern coast is cliffed at the northern end but is otherwise featureless.

On the south coast there is fairly good anchorage in Port Vato in 8 fathoms, off the trading station. Rannon anchorage on the north-west coast is an open roadstead with anchorage in 7 fathoms on black sand. Rodd's anchorage to the north of it is of similar character, except that the bottom is of white sand.

Social and Economic Conditions

Disease, the labour traffic, and more recently the illicit sale of liquor have caused a heavy decline in population on Ambrim. In 1916 the population was 5,591; in 1936 it was believed to be only about 4,000. The people live mainly in the north and west of the island. Culturally they are closely akin to the natives of Malekula. Presbyterian missionaries settled on the island in 1883. In 1892 they established a hospital at Dip point, but this was destroyed in the eruption of 1913 and has not been restored. The 1929 eruption again destroyed Presbyterian mission property (p. 517). At present there is a Presbyterian mission station at Rannon anchorage. There are also two Marist mission stations—at Craig cove and Olal—and a Seventh Day Adventist station at Limbil, in the north of the island. There were formerly several European-owned coconut plantations on the island.

RAGA AND MAEWO

Raga and Maewo are the two northernmost islands in the eastern chain of the New Hebrides proper. South point on Raga is 6 miles from the north of Ambrim, and North point on Maewo is about 25 miles from Mera Lava, the most southerly of the Banks islands. Both islands are long and narrow. Raga is about 39 miles from north to south and has an average breadth of about 7 miles; Maewo is about 33 miles long and about 4 miles broad (Fig. 192). The two islands are separated by the narrow Patteson passage. They were sighted by Quiros in 1606 and, together with Omba, were mistaken for one extensive land. The name Raga has frequently been rendered Aragh-Aragh. The island was named Pentecôte by Bougainville in commemoration of the season at which he visited it in 1768; this has been rendered in English as both Pentecost and Whitsuntide. Maewo was named Aurora by Bougainville.

Physical Geography

Both islands are mainly of volcanic formation, though there is a large area of coral limestone in the north of Maewo and there appear to be similar deposits in the north and on the west coast of Raga. A central mountain range forms the backbone.

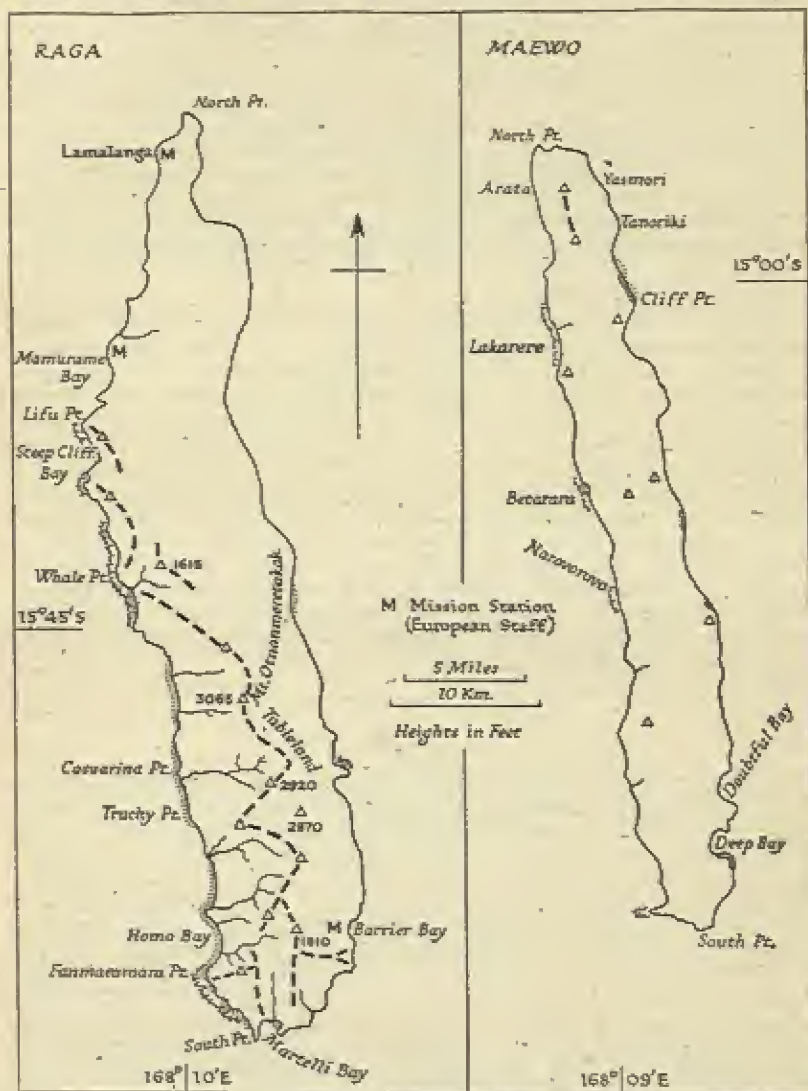


Fig. 192. Raga and Maewo

The south-west coast of Raga and a few anchorage areas alone have been surveyed; the coastline elsewhere is shown only approximately. Based on: (1) Admiralty charts nos. 1508, 1570, 3131; (2) other official sources.

of both islands. That on Raga rises to 3,065 ft. at mount Otnanmeretakak, an old crater of large size. On Maewot he range rises to about 2,000 ft.; there is a crater, with its wall broken down on the western side, just south of Betarara. Both Raga and Maewo have a very damp climate, are covered by dense rain forest, and have numerous streams. At Lakarere, on Maewo, there is a waterfall and a broad stream running from it to the sea—for long a popular watering place for ships.

The coasts of both islands are almost without indentations. The south-west coast of Raga alone has been surveyed. This has many sandy beaches, backed by low rounded promontories. There are several stretches of fringing reef. The east coast of Raga is bordered by a narrow reef. Patches of reef also occur along the west coast of Maewo. On the east coast of Maewo there are cliffs at several points, where spurs from the central range reach the coast. Anchorage is available on the west coast of Raga at various points, including Vunmaramara (near Lamalanga mission station), Steep Cliff bay, and Mamurame bay. On the west coast of Maewo anchorage is available at Betarara (in 8 fathoms) and Lakarere.

Social and Economic Conditions

Raga has a native population of about 6,000. In the relatively healthy northern part of the island the population is believed to be now increasing. The people of this area have close contacts with those of the north-east of Omba. On Maewo the population has greatly declined. It was estimated in 1936 at only 400, most of which is concentrated in the north of the island. The people are more akin culturally to the Banks islanders than to their neighbours on Raga and Omba. Maewo has at various times had traders, but it has attracted little interest as a centre for European plantations. Raga, on the other hand, has had several French-owned plantations along the west coast; these have been carried on until fairly recent years. Mission work has been in the hands of the Melanesian Mission on Maewo, where there is a station under a native priest at Tanoriki, and in northern Raga. At Lamalanga, on Raga, the Melanesian Mission has normally stationed European women missionaries with training in nursing; at Steep Cliff bay there was also a mission house which was occupied intermittently. In Raga the Marist mission has also been active, with stations at Mamurame bay, Melsisi and Barrier bay.

OMBA

Omba (lat. $15^{\circ} 17' S$, long. $167^{\circ} 57' E$, at Lolowai) lies 7 miles west of the southern point of Maewo. It is about 24 miles long from north-east to south-west, and about 9 to 10 miles in greatest width. The island has never been surveyed, so that detailed description even of the coasts is impossible (Fig. 193). The name Omba is frequently spelt Aoba, Oba or Opa; and the island was formerly known to Europeans as Lepers' island. It apparently obtained this latter name through the wrong identification of leucoderma, then prevalent among its people; leprosy is believed to have been non-existent, or extremely rare, on the island.

Physical Geography

Omba is entirely of volcanic formation. In the north-east and south-west there are small areas of low-lying and undulating lands, but most of the island is covered by a mountain range which, seen from the sea, resembles a whale's back in outline. This rises to 4,000 ft. in mount Lombenben (which is the mythical home of the god Tagoro, p. 550). The summit of the mountain consists of an extensive plateau, on which there are several crater lakes (marshy areas, with the earth still noticeably warm in places) and several craters (including one from which smoke still frequently rises).

The vegetation of Omba is very similar to that of Espiritu Santo. The most notable trees in the forest are the flame tree and tree ferns; coconut palms are cultivated extensively round the villages, both in the coastal areas and on the lower slopes of the mountain range.

At the north-east point a reef stretches $\frac{1}{2}$ mile to seaward; elsewhere the coast appears to be generally free of reefs. Shores are steep-to except in the north-east. Probably the best anchorage is that at Lolowai bay (Plate 79), in the north-east, in 12 fathoms; there is a boat passage through the reef to a landing place below the mission station. Anchorage is also available at Vanihe bay, just to the west of Lolowai. Vessels anchor regularly at many points on the north-west coast to collect copra and to land stores. The most used of these anchorages are: Longangua, in 10 fathoms, at 300 yd. from the shore; Lolopuepue; Walurigi; near Lomi bluff; and

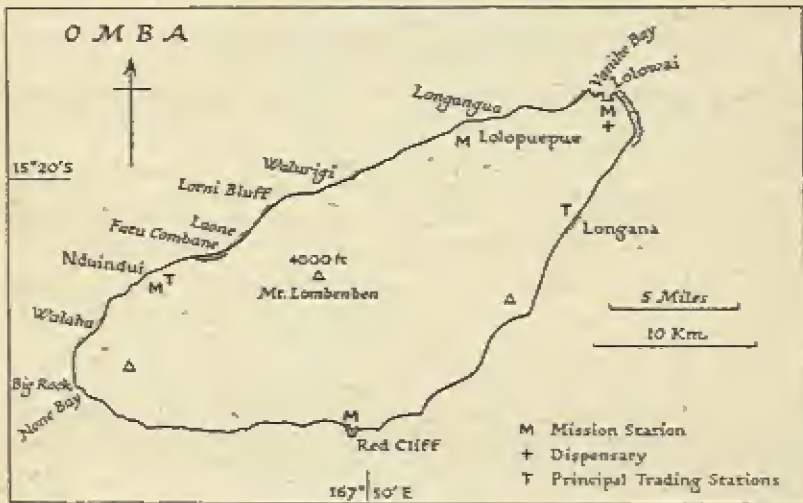


Fig. 193. Omba

With the exception of certain anchorage areas, the whole of Omba is unsurveyed. Only the general trend of the coastline can thus be shown, and the summit of mount Lombenben is similarly only approximately indicated. Based on: (1) Admiralty charts nos. 1508, 3033; (2) other official sources.

Nduindui, where there is a wharf. At most the holding ground is not good. The flood stream sets strongly northward along this coast, making the sea choppy; the swell on the beaches makes landing difficult. On the south-east coast anchorages appear to be few, and landing is rather dangerous nearly everywhere owing to the shores' being bordered by boulders.

Social and Economic Conditions

Omba ranks with Tana, Tongoa and Paama as an island with a large and virile native population and no European plantations. The population of Omba is now estimated at from 5,000 to 6,000. The people are much paler skinned than most other New Hebrideans, often with straight or wavy hair and sometimes with a markedly Mongolian cast of features. Their culture shows many Polynesian characteristics. By contrast with the situation in neighbouring islands, the cult

of the *sukwe* (p. 548) is much less important. The women are frequently employed as domestic servants by settlers in other parts of the New Hebrides, and many have become the wives of Europeans. The staple export has long been copra, which is prepared by the people in all parts of the island. There are also native-owned cocoa plantations. Cotton also was formerly grown extensively. More recently there have been experiments in the growing of coffee. At Nduindui there is an old-established and important trading station; there is another trading station at Longana. The headquarters of the Melanesian Mission for the New Hebrides is at Lolowai, where there are a hospital, a training college for native teachers and clergy, and boys' and girls' schools. At Nduindui there is a congregation of the Church of Christ, which is ministered to entirely by natives. The Marist mission has stations at Lolopuepue and Nangire; and there is a Seventh Day Adventist station at Red Cliff.

THE BANKS ISLANDS

The Banks islands lie to the north of the New Hebrides proper. Mera Lava, the most southern island of the group, is about 25 miles north of Maewo. There are two major islands—Gaua and Vanua Lava—each with an area of about 85 sq. miles; six smaller islands—Mera Lava, Merig, Mota, Mota Lava, Rowa and Ureparapara—and several off-lying islets and reefs. With the exception of Rowa, each of the islands appears to be a broken-down volcanic cone; present-day volcanic activity is confined to fumaroles and sulphur springs on Gaua, Vanua Lava and Ureparapara.

The islands were named by Captain William Bligh in honour of his patron, Sir Joseph Banks, the naturalist. The population of the Banks islands was estimated in 1936 at 2,300. The people are somewhat distinct in physical type from those of most of the islands farther south. They are lighter-skinned, have long faces, high foreheads, and narrow, often hooked, noses. There are also cultural distinctions. The wealth and quality of their personal ornaments—such as ear-sticks, bracelets and necklaces—are more reminiscent of the decorative art of the Solomon islanders than of that of the other peoples of the New Hebrides.

MERA LAVA (MERLAV)

Mera Lava (lat. $14^{\circ} 25' S$, long. $168^{\circ} 03' E$) is a well-preserved volcanic cone about 2 miles across at the base and rising to a height of 2,900 ft. The coast is steep-to except on the north-east, where there is a small off-lying islet. The native people, who are very energetic, have carved their gardens out of the side of the mountain. There is a Melanesian Mission station in charge of a native teacher.

MERIG

Merig (lat. $14^{\circ} 16' S$, long. $167^{\circ} 48' E$) is a small islet lying about 13 miles to the east of Gaua. It is about $\frac{1}{2}$ mile from north to south and rises to about 700 ft. A narrow coastal plain gives it a hat-shaped profile. There is no anchorage and landing is difficult. There is a small native population.

GAUA (Fig. 194)

Gaua (lat. $14^{\circ} 15' S$, long. $167^{\circ} 30' E$) was discovered by Quiros in 1606 and named by him Santa Maria. It is roughly circular in shape, with a diameter of about 12 miles. In origin, the island appears to be a large eroded volcano; a crescent-shaped

lake occupies part of the former crater. The surface of the lake lies about 1,100 ft. above sea level; it is 200-300 ft. deep. The Lusal river, which has a conspicuous waterfall, carries the surplus water from the lake. Round the shores of the lake are groups of hot springs. The island is well wooded and there is a narrow coastal plain on the east. The coast has few marked features. Such small promontories as White Rock point have steep cliffs and there are short stretches of sandy beach in some of the bays. Fringing reef occurs in patches. Good anchorage can be obtained in Lakona bay in 10 fathoms; at Masevonu in 12 fathoms; and at Losolava in from 5 to 13 fathoms in a break in the shore reef.

The island is the most thickly populated in the group, having probably rather more than half the total population of the Banks islands. The people rely for money

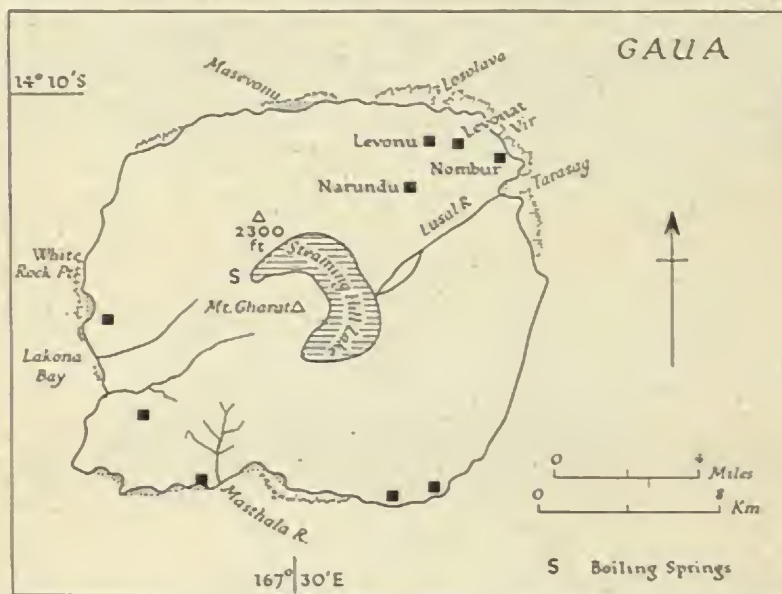


Fig. 194. Gaua

Based on: (1) Admiralty chart no. 174; (2) *Geographical Journal*, vol. LXXIII, p. 315 (London, 1929).

income upon the export of small quantities of copra and shell and upon service as labourers in other islands. The Melanesian Mission has several stations on the island.

VANUA LAVA

Vanua Lava (Fig. 195) lies 14 miles north of Gaua. It was formerly known as Great Banks island.

Physical Geography

Vanua Lava is wholly of volcanic formation. Two rugged mountain ranges traverse the island from north to south. The highest points are mount Tauesurhlava (3,120 ft.), about 2 miles inland from the south coast, and mount Suretamati (3,000 ft.), in the centre of the island. The composition and general trend of these

ridges suggest that they represent the south-west wall of a former crater which once included the islands of Mota and Mota Lava to the east. In the region of mount Surekamati there are fumaroles and hot springs charged with sulphuric acid which drain into the Rhapuna river. The latter, crossing an area of low, swampy land, enters the sea at Port Patteson. Except for the peninsulas of Paut point (the southernmost tip of the island) and South head, there are few prominent coastal features. The west coast is marked for considerable stretches by steep, rocky cliffs. Short stretches of fringing reef occur on all coasts and there are several sandy beaches, particularly on the west coast and on the northern shore



Fig. 195. Vanua Lava

Based mainly on Admiralty chart no. 174.

of Port Patteson. Off the east coast lie the islets of Ravenga, surrounded by fringing reef, and of Kwakea and Niwula, enclosed within a single circuit of reef. There are several good anchorages distributed round the coast. Port Patteson provides anchorage in 18 fathoms in its southern half (South bay) and in 6 fathoms in its northern half (Nawono bay). Mosina bay is too exposed to the south-east to be suitable, but good shelter with depths of 10-15 fathoms is available in Vureas bay.

Social and Economic Conditions

The native population of Vanua Lava is small. The island suffered severely during the latter years of the nineteenth century from the attention of labour

recruiters. Like most of the Banks islanders, the people are Christians and adherents of the Melanesian Mission. For many years the mission had a station with European staff at Vureas bay, but the island is now in charge of native priests.

There is a large coconut plantation, owned by a French company, at Port Patteson, and another plantation on Kwakea island. Rubber has also been planted. Several attempts have been made to exploit the sulphur deposits commercially, but without success.

MOTA

Mota lies 7 miles to the east of Vanua Lava. It has also been known as Sugarloaf from its peculiar shape. The island consists of a coastal plain of raised coral limestone formation, from which a 'sugarloaf' peak of volcanic rock rises precipitously in the centre of the island. The coast consists of high limestone cliffs, with a narrow fringing reef. Landing is difficult. Ships anchor about $\frac{1}{2}$ mile from the shore. Mota was formerly the winter headquarters of the Bishop of Melanesia, and a school for the training of native mission teachers was maintained on the island. The Mota language was adopted as a *lingua franca* for the whole of the Melanesian Mission's field of work in the New Hebrides and the Solomons (p. 541). At present mission work on Mota is in charge of a native missionary. The people live in several villages round the coast.

MOTA LAVA (MOTLAV)

Mota Lava lies in lat. $13^{\circ} 40' S$, long. $167^{\circ} 40' E$. It has also been named Saddle island and Valua, while the name Mota Lava has sometimes been restricted to the south-west peninsula. It is an approximately rectangular island with a long narrow peninsula projecting to the south-west. The total length from east to west is about 6 miles and breadth about 2 miles. In the centre are two round hills, 1,465 ft. and 1,410 ft. high respectively. The western coast is fringed with reef, which also embraces the small islet of Raa. Milli bay on the west coast provides anchorage and a fairly good landing. The small native population lives in three villages. There is an old plantation at Milli bay.

ROWA

Rowa, known also as the Reef islets, lies about 8 miles to the north of Vanua Lava. It consists of five small islets scattered along a crescentic coral reef which is about $5\frac{1}{2}$ miles long. The reef appears to be steep-to except at its south-western end. The islets are low and sandy and covered with trees. The northernmost has a native population of 50-60, which, however, migrates at times to Ureparapara.

UREPARAPARA AND VATGANAI

Ureparapara (lat. $13^{\circ} 32' S$, long. $167^{\circ} 20' E$) is an oval island, about $4\frac{1}{2}$ miles long and $3\frac{1}{2}$ miles wide. It was formerly known as Bligh island, and is now sometimes known as Norbarbar. In origin it is an ancient crater which has been breached by the sea. The crater rim rises to a maximum height of 2,440 ft. on the west. Dives bay, which occupies the eastern part of the crater, and much of the northern and western coasts, are fringed with a narrow coral reef. Anchorage can be obtained in from 10 to 12 fathoms at the head of Dives bay, but the bottom is foul and squalls from the hills are dangerous. The native people live in three coastal villages, one of which is on the shore of Dives bay (Plate 82).

The small islet of Vatganai lies 22 miles north of Ureparapara. It consists of two high, tree-covered rocks.

TORRES ISLANDS

The Torres islands (Fig. 196), known sometimes as the Vava islands, lie between lat. $13^{\circ} 05'$ and $13^{\circ} 28' S$ and between long. $166^{\circ} 33'$ and $166^{\circ} 43' E$. They are a chain of five islands—Toga, Loh, Tegua, Metoma and Hiw—and form the northernmost extension of the western chain of the New Hebrides. They are composed of coral limestone in terraced formation, though it has been thought probable that this limestone overlies beds of volcanic tuff. Earth tremors are common. The vegetation is dense, with many forest trees. Water is scarce on all the islands owing to the porous soil. The natives depend for water on the milk of coconuts and on the rain water which accumulates at the roots of trees and in a few holes in the coral rock. Physically, the people show some admixture of Polynesian blood; culturally, they are akin to the Banks islanders. They have been greatly reduced in numbers by disease and by recruiting for plantation labour. The total population has recently been estimated at 200.

TOGA

Toga, also known as South island, is the southernmost of the group and lies 36 miles west of Ureparapara. It is about $3\frac{1}{2}$ miles long from north to south, with a maximum width of $2\frac{1}{2}$ miles from east to west. The centre is occupied by a plateau with a maximum height of 896 ft. which falls away steeply on all sides to a narrow coastal plain. The main promontories on the coast are slightly cliffed; there is some fringing coral off the south-east and north-west coasts. The best landing is to the east of Brénéol point.

LOH

Loh, $2\frac{1}{2}$ miles north-westward of Toga, is of crescentic shape, about 4 miles long from north to south and about a mile wide (Plate 80). It has two hills (351 ft. and 390 ft. high respectively) separated by low land, features which, when viewed from the south-west, explain the alternative name of Saddle island. The northern half of the island is cut in two by an area of marsh and mangrove swamp which extends from coast to coast. There are patches of fringing reef on all coasts and on each side of the entrance to Log bay, which was formerly used as a landing place. A better landing place has since been found in Boat cove, at the western end of the swamp. Anchorage can be obtained in 18 fathoms in Vipaka anchorage off the south-west coast.

TEGUA AND METOMA

Tegua, also known as Middle island, $2\frac{1}{2}$ miles northward of Loh, is of irregular shape with a greatest length from east to west of 4 miles. In the interior is a steep-sided plateau of the type found on Toga. It reaches a maximum height of 640 ft. The chief coastal features are three long narrow bays on the west, north and south-east. Small patches of coral occur in Hayter and Scorff bays. Hayter bay, protected by Ethel reef, gives well-protected anchorage in 16 fathoms; there is no boat passage through the fringing reef at the head of the bay. Scorff bay, though protected from the swell by fringing reef, is open to the prevailing wind and is probably of little value for anchorage.

Metoma, a small oval island about $1\frac{1}{2}$ miles from east to west and 410 ft. high, is separated from Tegua by D'Hestreux passage. It is uninhabited.

HIW

Hiw, the northernmost island of the Torres group, is also the largest and highest. It is 8 miles long from north to south, with a maximum width of $3\frac{1}{2}$ miles. It rises

in three terraces to a height of 1,230 ft. The coast has few striking features beyond the irregularly indented Picot bay on the west and local patches of fringing reef

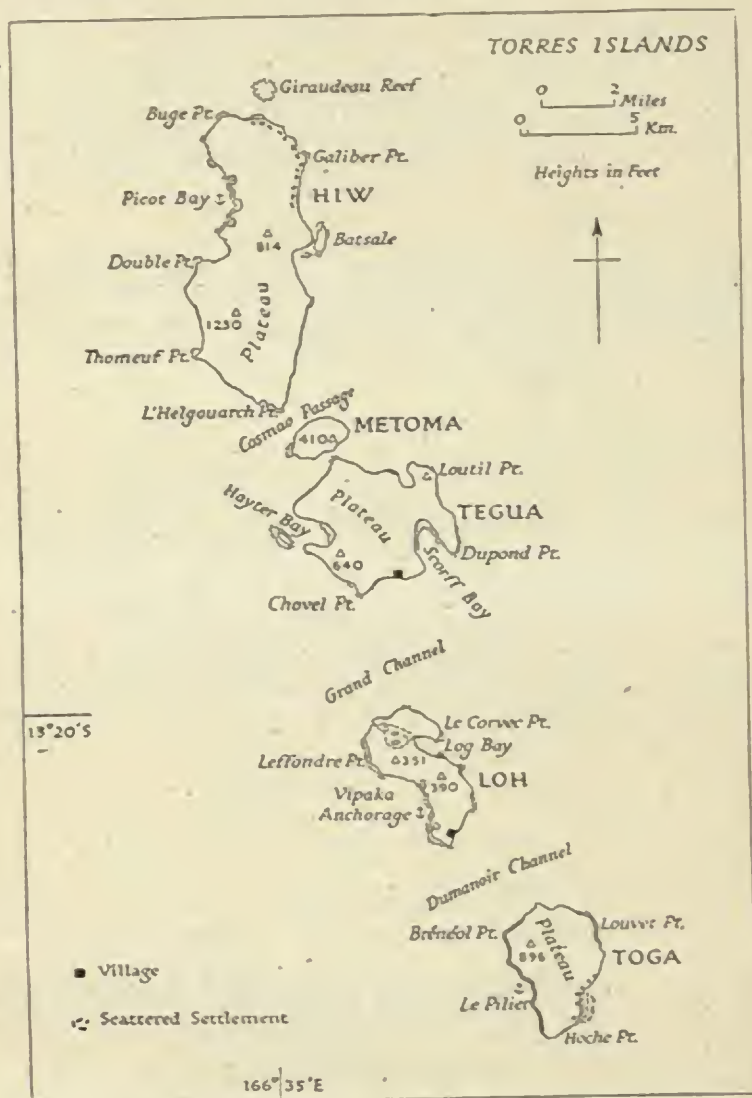


Fig. 196. Torres islands

Based mainly on French Service Hydrographique de la Marine chart no. 4975.

off the major promontories. Picot bay affords tolerable anchorage in from 16 to 23 fathoms.

SOUTHERN ISLANDS

The islands of Aneityum, Tana, Futuna, Aniwa and Eromanga lie apart from the remaining islands of the New Hebrides. Eromanga, the most northern of them, is separated from Efate by a channel over 60 miles wide. Structurally, they are similar to most of the larger islands of the group, being formed predominantly of volcanic rocks overlaid in some areas with raised coral limestone. Their inhabitants, however, show certain marked differences from most of the people farther north. Those of Tana, Futuna and Aniwa appear to possess a considerable admixture of Polynesian

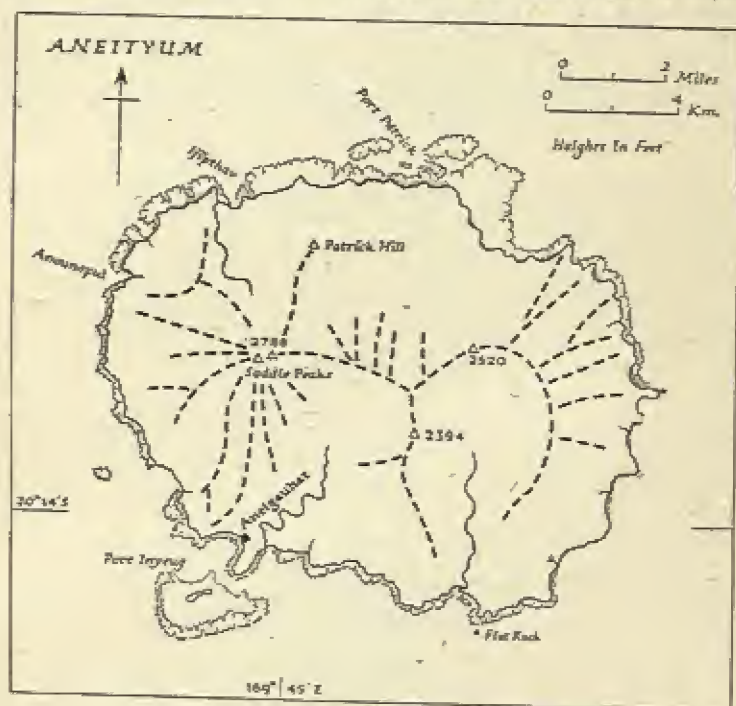


Fig. 197. Aneityum

Based on Admiralty charts nos. 1071, 2904.

blood. All the southern islanders speak dialects of a single language and possess many cultural features in common.

ANEITYUM (Fig. 197)

Aneityum (lat. 20° 12' S, long. 169° 47' E) is the southernmost island of the New Hebrides. It is almost circular, about 10 miles from east to west, and is wholly of volcanic origin. A high central massif rises to 2,788 ft. in the Saddle peaks at its western end. Buttress-like ridges radiate from it towards the sea, dividing the island into several deep valleys. Some of the valleys contain permanent streams. The whole island is fertile and densely wooded. The coast, which is but slightly

indented, is almost completely encircled by fringing reef, and on the beach itself the sand has in some places been consolidated into a soft rock. Anchorage can be found in Port Inyeug, off the village of Anelgauhat, in 7-8 fathoms. It is protected by a detached section of reef from all but westerly winds. Port Patrick on the north coast has anchorage in 10-12 fathoms behind a reef; further shelter is afforded by large detached reefs to east and west.

The island was formerly thickly populated (p. 336), but in 1936 the native population was estimated to be only 216. In recent years there have been several European residents at Anelgauhat, mainly engaged in the cutting of kauri timber, for which purpose a small sawmill had been erected.

TANA (Fig. 198)

Tana lies about 40 miles north-west of Aneityum. It is about 22 miles long and about 13 miles in maximum breadth. The name Tana was obtained by Cook in questioning the natives of Eromanga; it means 'ground' or 'land'. The island is known to its own people as Ipari.

Physical Geography

Most of the island of Tana is formed of scoria and agglomerate, but there is raised coral limestone bordering parts of the east, north and west coasts. There is high ground in both the north and the south of the island, rising to 2,000 ft. in the north and to over 3,000 ft. in the south. The form and structure of the land between suggests that Tana is a fragment of a former large crater of which the island of Aniwa (p. 603) formed another part. The volcano of Yasur (p. 517), which is in constant activity, has created around its base a miniature desert of volcanic ash (Plate 78), which is shaped by the winds into shifting dunes. With this exception there is thick forest on the eastern side of the island. In the centre and towards the west are considerable grassy tracts of nearly level country. There are steep cliffs on north and south coasts and sandy beaches and stretches of coral reef on east and west. No really good anchorages exist. Weasisi bay on the east coast offers fair anchorage in south-east winds but is made unpleasant by ashes from the volcano. Port Resolution has so silted up as to be useless for anchorage. Lenakel bay on the west coast has anchorage in from 10 to 18 fathoms.

Social and Economic Conditions

During the latter part of the nineteenth century the men of Tana were in great demand as indentured labourers and as boat crews on labour vessels. In this way the island lost a considerable part of its population. In recent years, however, the population has again become stabilized. In 1936 it totalled 5,721. The people are mainly engaged in agriculture on their own account. Few go away to work in other islands for European settlers.

Both the British and French administrative headquarters for the Southern District are at Lenakel, on the west coast. At Lenakel also are situated a Presbyterian mission station and hospital, a small French government hospital, and a Marist mission station. There is a Seventh Day Adventist mission station at Port Resolution, on the east coast. There are a number of British residents on the island, including traders. A road, unmetalled but motorable, runs from Lenakel to Weasisi bay and Port Resolution.

FUTUNA

Futuna (lat. $19^{\circ} 31' S$, long. $170^{\circ} 11' E$) lies about 36 miles east of Tana. It is also known as Eronan (Erronan), and is not to be confused with Futuna, Hoorn islands (p. 291). It is roughly circular and about 2 miles across. It appears to be of volcanic

origin. Viewed from the south-east, its profile appears like a truncated cone. The flat summit reaches a height of 1,931 ft. The coast is steep-to except for three small sandy beaches to the west of North-east point. Indifferent anchorage is obtainable off this point in 24 fathoms and there is a good landing place in a small cove nearby. The island was formerly a principal centre of the Presbyterian mission. But during the past sixty years there has been considerable depopulation. In 1936 the population was 259.

ANIWA

Aniwa (lat. $19^{\circ} 18' S$, long. $169^{\circ} 35' E$) lies about 13 miles east-north-east of Tana. It is about 4 miles from north to south and about 2 miles from east to west. The island, which is from 120 to 150 ft. high, is composed of raised coral limestone probably overlying volcanic rocks. It is well wooded and has no good anchorage. In recent years its population has been slowly increasing; in 1936 it was 176.

EROMANGA (Fig. 198)

Eromanga (lat. $18^{\circ} 49' S$, long. $169^{\circ} 05' E$), known by the French as Erromango, lies about 60 miles to the south of Efate. The largest of the southern islands, it



Fig. 199. Traitor's Head, Eromanga

From the north-west (Potnaraven). Based on a drawing by Miss L. E. Cheesman.

is about 30 miles long from north-west to south-east and about 20 miles broad. It is composed mainly of lavas and volcanic agglomerates with raised coral in terraced formation on the lowlands up to 800 ft. The interior is mountainous with two main chains, one in the north trending north and south, and a second in the west trending westwards through mount Robertson to the coast at Paton point. The south-eastern parts of the island, exposed to the trade-wind, are well wooded and well watered. The west side contains a tract of grassland and experiences frequent droughts. Of the numerous rivers, the Cook and the Williams are each over 12 miles long; the former is navigable for several miles. The coasts, though little indented, are varied in character. Most are steep-to. They are cliffed on the south, but low-lying and fringed with coral reefs around Cook bay and Polenia bay. Traitor's Head (Fig. 199) on the east coast rises with steep cliffs to 2,700 ft. Anchorage can be found in Dillon bay and in the south-west of Polenia bay.

Eromanga has been very largely depopulated. In 1861 it was believed to have about 6,000 people; in 1936 it had 391. For many years a British settler has used the grasslands in the west of the island for a sheep run. Sandalwood, at one time the sole export of the island, has not yet entirely disappeared.

MATTHEW AND HUNTER ISLANDS

Matthew and Hunter islands lie 150 and 180 miles respectively to the south-east of Aneityum. They represent the southern limit of a belt of volcanic activity which extends northwards through the New Hebrides to Tinakula, in the Santa Cruz group (p. 693). Matthew island was discovered by Captain Gilbert of the British ship *Charlotte* in 1788 and Hunter island by Captain Fearn of the *Hunter*, of Calcutta, in 1798. Both are uninhabited and rarely visited. They have been shown on various maps as forming part of the New Hebrides or of New Caledonia; but, in fact, they have not been claimed either by France or Britain, or by any other Power.

Matthew island (lat. $22^{\circ} 20' S$, long. $171^{\circ} 19' E$) is roughly triangular in shape, with an area of about 30 acres, and rises to a height of 465 ft. in a central peak. It is formed principally of basalt. Large numbers of sea birds find shelter upon it. Anchorage may be found at 500 yd. from the western shore, in 27-32 fathoms, on a bottom of fine sand.

Hunter island (lat. $22^{\circ} 24' S$, long. $172^{\circ} 03' E$) is slightly over $\frac{1}{2}$ mile in length from north to south and $\frac{1}{2}$ mile in average breadth and has an area of about 100 acres. Steep cliffs rise from the shore on all sides, above which grassy slopes, studded with trees, rise to a peak 974 ft. in height near the west coast. Jets of sulphurous vapour have been seen rising at several points; but there are no other signs of present volcanic activity. Landing can probably be made on the north or north-west shores in favourable weather.

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For maps see Appendix I.

Chapter XV

GENERAL REVIEW OF THE SOLOMON ISLANDS

Physical Geography: History: Peoples: Administration: Social Services:
Economics: Ports and Settlements: Communications

The Solomon islands (Fig. 200) lie approximately between lat. 5° and 12° S and long. 154° and 163° E, to the north of the New Hebrides and to the east of New Guinea. The main group comprises a double chain of islands, stretching roughly from north-west to south-east. It includes seven major islands—Bougainville, Choiseul, Ysabel, New Georgia, Malaita, Guadalcanal and San Cristobal—between twenty and thirty smaller islands, and numerous islets. Many are very mountainous. In addition several smaller groups and isolated islands are normally considered as forming part of the archipelago and are so treated here. They include: to the south, the large island of Rennell and its smaller neighbour Bellona; to the south-east, the Santa Cruz group (of Ndeni, Vanikoro and Utupua), the Reef and Taumako groups, and the small isolated islands of Tikopia, Anuta and Fatutaka; and, to the east and north, a number of atolls of which the most important are Ontong Java and Sikaiana.

For administrative purposes the major part of the group forms the British Solomon Islands Protectorate, a territory under the jurisdiction of the British High Commissioner for the Western Pacific. Bougainville, Buka and several atolls in the north of the group, however, fall within the limits of the Mandated Territory of New Guinea, of which they constitute the Kieta District; they are thus administered by the Commonwealth of Australia.

PHYSICAL GEOGRAPHY

GEOLOGY

The geological structure of the Solomons is as yet very imperfectly known. The pioneer work of Dr. H. B. Guppy is still the major source of information. He describes one or two of the smaller islands in detail, but the difficulties and dangers of travel in the larger islands about 1880 meant that scattered scraps of information from coastal districts alone were available for them.

The main chain of the Solomon islands is of predominantly

volcanic origin, being itself a link in the larger chain of volcanic ranges and islands stretching from south-east Asia through Sumatra, Java and New Guinea and continuing beyond the Solomons into the New Hebrides. The volcanic activity which has been the main agent in forming the group has been intermittent from Cretaceous or early Tertiary times to the present day. A concurrent and inter-related series of changes in the relative levels of land and sea has resulted in some marine erosion and the formation of sedimentary rocks; many of these last are now elevated high above sea level. The interaction of the two agencies is seen in a few areas in metamorphic rocks.

The core of the main islands is composed of ancient lavas. As these rocks appear to be subaerial flows, land of some kind must have existed in the area at that early period. On many of the islands they are overlaid by more recent deposits, both sedimentary and volcanic. The exact interrelationships of the two types are still obscure, but it would appear that submergence over a wide area occurred during early Tertiary times, followed in turn by a gradual re-emergence of the land and a renewal of volcanic activity. The first sedimentary rocks (pteropod oozes) to be laid down contain marine organisms and debris of volcanic origin. These deposits at present extend up the hillsides, to heights of as much as 1,500 ft. on Choiseul. Overlying these rocks are harder beds of coral limestone which, on Ganongga, reach 1,600 ft. above sea level and are cut into terraces at heights of about 400, 800, and 1,200 ft. These terraces clearly indicate long pauses in the re-emergence of the land. Where the limestone reaches the coast, as on Treasury island, steps cut by wave action denote two recent stages in the process of upheaval, an uplift of 6 or 7 ft. and another of about 5 ft. A datum mark cut by Guppy in the beach on Ugi in 1882 showed an elevation of 1 ft. in the 50 years following that date.

There is some evidence that, in its more recent stages at least, elevation has not been uniform over the whole area. For instance, the steep-to and embayed southern coasts of Guadalcanal contrast strongly with the featureless northern coast, backed by a continuous coastal plain. It is therefore inferred that the island has been tilted downwards to the south-west about its longer axis. San Cristobal shows similar features, and Buka (Fig. 201) also has an extensive plain formed of coral limestone on its east side, whereas the volcanic axis follows the west coast closely.

These differential movements may perhaps be attributed to a

relatively recent renewal of volcanic activity which has persisted in one or two areas to the present day. In such small islands as Fauro, rocks attributable to this second period of activity—andesites, pitch-



Fig. 201. Buka: geology

Based on a sketch map by K. Sapper in *Mitteilungen aus den Deutschen Schutzgebieten*, Band XXIII (Berlin, 1910).

stones, tuffs and agglomerates—overlie the earlier volcanic beds. Some other small islands—e.g., Savo and Simbo—are composed entirely of the recent series.

Some of the small islands within the main chain—e.g., Treasury, Santa Ana and Santa Catalina—are composed entirely of sedimentary deposits, though in each case these probably rest on submerged peaks of volcanic origin. Outside the main chain are several reefs and islands of limestone, all basically of atoll formation, which have experienced varying degrees of elevation. Indispensable and Roncador reefs are still awash and thus represent the earliest stages in the process. Nissan, Kilinailau, Tauu, Nukumanu and Ontong Java are normal atolls in that the land surface is only a few feet above sea level. Bellona and Rennell have undergone great elevation. They have been raised 250-500 ft. above sea level, so that in the first the lagoon has disappeared, and in the second it has shrunk to a fresh-water lake.

Vulcanism

Volcanic activity still continues in the Solomons, though on a reduced scale. Active volcanoes exist at each end of the group, in mounts Balbi and Bagana, in Bougainville, and in Tinakula, a small volcanic island in the Santa Cruz group. Bagana (9,850 ft.) is a very prominent cone, the summit of which is generally veiled in smoke and mist. Balbi (10,171 ft.), with a summit about 5 sq. miles in area, has a crater about 550 yd. wide containing a pool of hot lava at the bottom. When Tinakula is in eruption, lava can be seen streaming down its north-west side. The small island of Savo off the north-west of Guadalcanal is a large volcanic cone standing in deep water. Mendaña is said to have seen it in eruption in 1568. Sulphurous vapour still escapes from fissures in the crater, and there are hot springs near the coast. On Simbo fumaroles, hot springs and solfataras are numerous.

Earthquakes are frequent but seldom severe. During 1882-3, 25 were recorded in 18 months. They are most prevalent at the western end of the group where volcanic activity is still greatest. A severe shock occurred on 30 April 1939 in Guadalcanal and the Russell islands; buildings and jetties were destroyed.

RELIEF

As with geology, lack of information hinders the presentation of a coherent account of the physiography of the Solomons. The interiors of nearly all are very imperfectly mapped.

All the main islands contain a range of mountains as backbone.

(In Guadalcanal, the main range follows the south coast a few miles inland. Other mountains complexes exist between this range and the north coast.) On all the islands, ranges built up in the earlier phase of volcanic activity are deeply eroded and in most parts present a fairly rugged appearance (Plate 91). An exception is western San Cristobal, where their profiles are more rounded with long rolling ridges and smooth dome-shaped hills. The volcanic cones on such smaller islands as Savo are dissected to some degree by streams but in the main preserve their conical profile, with gradients that flatten out gently towards the base. The highest peaks occur in Guadalcanal and Bougainville. On the former, mount Popomanasiu reaches 8,005 ft. and the Kavo range has heights of between 7,000 and 7,500 ft. On the latter are the volcanoes of Balbi and Bagana and numerous other high peaks. The main ridges in the other islands attain heights of 2,000-4,000 ft.

Generally the mountains slope gently down to a coastal plain. Only on the north-west coast of Guadalcanal does this attain any great width. In a few areas, as in southern San Cristobal, the mountains fall precipitously to the sea.

Owing to the abundant rainfall and the non-porous nature of many of the rocks, river systems are well developed (Plates 92, 96). However, owing to the long narrow shape of most of the islands, the rivers are generally only a few miles long and relatively straight in course. Sudden heavy rainfall in the mountains leads to rapid rise in the river level and to serious but temporary flooding of the coastal plain. Most of them have sand bars at their mouths (Plate 92), so that only small boats can navigate their lower reaches. Many have alluvial deltas covered with mangrove swamp (Plate 93).

All the limestone islands lack river systems, as the rock is porous enough to absorb water directly. The true atolls, such as Ontong Java, are circuits of reef sufficiently elevated for some sections to have become dry land with a superficial deposit of sandy soil. Santa Ana has been elevated further; the lagoon floor has been raised about 25 ft. above sea level and is now a land surface, swampy in parts, with two small freshwater lakes. In Rennell, the south-western part of the former lagoon contains lake Tenggano, about 70 ft. above sea level. Steep cliffs round the coast represent the former seaward edge of the atoll, as they do also on Bellona. The surfaces of both Rennell and Bellona have been eroded into a series of crevasses, pinnacles and loose coral boulders (Plate 94).



Plate 93. Group of natives, Bellona

The extremely rugged surface of the coral limestone of which the island is built here shows clearly.



Plate 94. The Pachu river, Choiseul

A scene typical of the sluggish rivers which flow through mangrove swamps at their mouths. In the foreground are the aerial roots of the mangroves.





 Plate 95. Mana Kwoi, Malaita
 The heavily forested mountains here approach the coast.



Plate 96. Creek at Roas bay, Malaita
 The vegetation is typical of such sheltered sections of the coast.

COASTS

Much of the coasts of the Solomon islands is still unsurveyed in detail. Coral reefs are a prominent feature of coasts throughout the group, but are lacking on some sections where the shore is steep-to, as for instance on the south coast of Guadalcanal. Elsewhere, both fringing and barrier types of reef occur (Plate 120). Fringing reefs are widely distributed but seldom continue for long stretches. Several massive barrier reefs exist, the most noteworthy being that on the north-east coast of Choiseul and those enclosing the Roviana and Marovo lagoons off New Georgia (Plate 115). In the case of the last two, the protecting reef has been raised to form a chain of limestone islands 200 ft. high. Other notable reefs lie off the south-east coast of Bougainville, off the west coast of Buka and off the west coast of Malaita, enclosing the Langalanga lagoon.

These reefs are of special significance to the navigator: in unsurveyed areas particularly they are a constant danger to shipping, but by enclosing vast lagoons they offer many actual and potential anchorages. Often, however, lack of surveys or the presence of coral heads and patches within the lagoons has prevented their utilization or restricted it to the small coasting vessels of local traders. Marovo and Roviana lagoons are of this limited value. Rendova harbour (p. 679), a small lagoon, is typical of those with depths sufficient for large ships. Details of individual anchorages are given later in the description of individual islands.

The coasts themselves present striking contrasts. On the one hand, the long south-western and north-eastern coasts of the main islands have few marked promontories or indentations. On the other hand, New Georgia and its adjacent islands present a complex of rugged, deeply embayed coasts and tortuous channels and lagoons. The southern extremities of Bougainville, Choiseul, Ysabel, Malaita, and San Cristobal and the northern end of Ysabel have clusters of islands lying off them.

Few high cliffs occur. The shores for the most part are flat and low-lying, fronting a narrow coastal plain. At the river mouths are areas of mangrove swamp. Beaches are for the most part sandy. Where the coast is of volcanic rocks, as on much of the south coast of Guadalcanal, the sand is black. Elsewhere, where limestone and coral predominate, it is white.

CLIMATE

The climate of the Solomons is in general similar to that of the neighbouring areas of New Guinea and the New Hebrides—hot, with a heavy rainfall. The chief criterion distinguishing the seasons is provided by the winds (Fig. 202). The period April–November is characterized by the south-east trade winds. In the southern part of the group these are stronger and more regular and tend to persist through the remaining months, interrupted by calms and north-

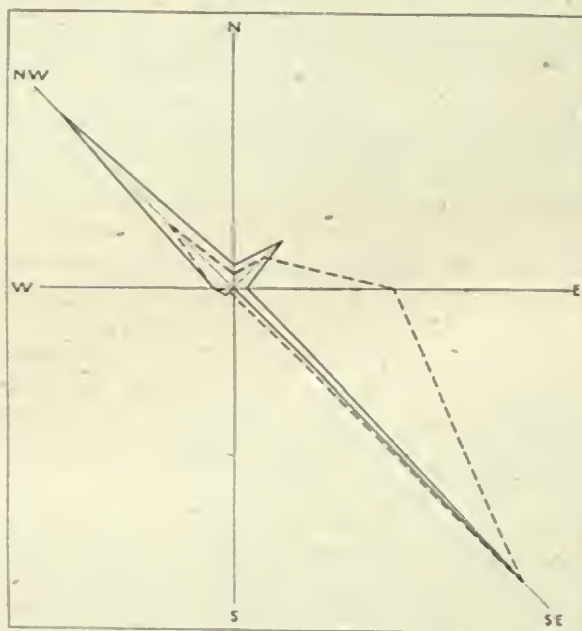


Fig. 202. Winds at Tulagi

For general explanation see Fig. 37. The pecked line shows winds at 0900 hr.; the solid line, those at 1600 hr. Based on an official source.

westerly monsoonal winds. In the northern and western parts of the group, these north-westerly winds and calms typify the season from January to April and sometimes reach the force of a moderate gale. Occasional backing of the wind from north to west generally presages gales, thunderstorms or rain. Rarely, hurricanes blow up from the south-east; in December 1935 one caused serious damage in the Santa Cruz district.

At Tulagi (Fig. 203) mean monthly temperature varies only

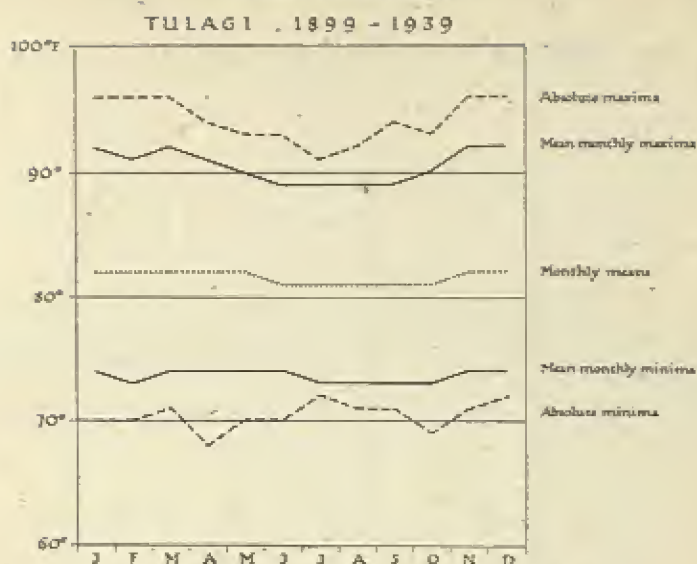


Fig. 203. Monthly temperatures, Tulagi, 1899-1939
Based on an official source.

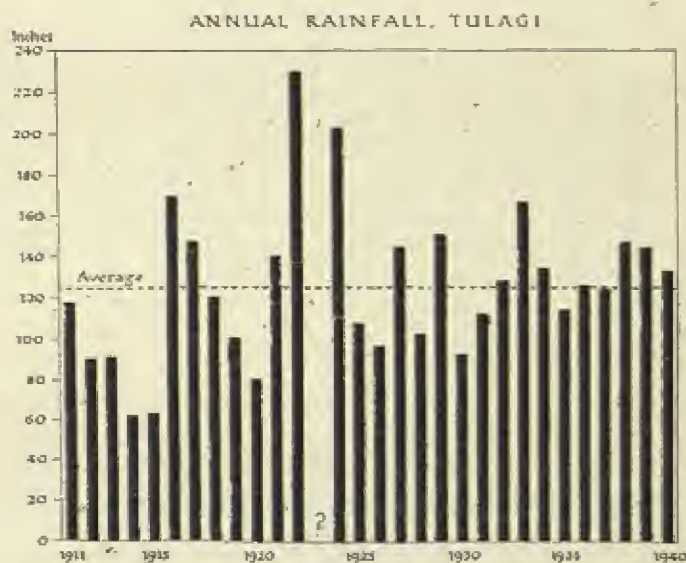


Fig. 204. Annual rainfall, Tulagi, 1911-40

The question mark indicates absence of data. Based on: (1) *Handbook of the British Solomon Islands Protectorate* (2nd edition, Suva, 1923); (2) *British Solomon Islands Protectorate Blue Book* for 1922, 1924-40 (Suva, 1922, 1923-40).

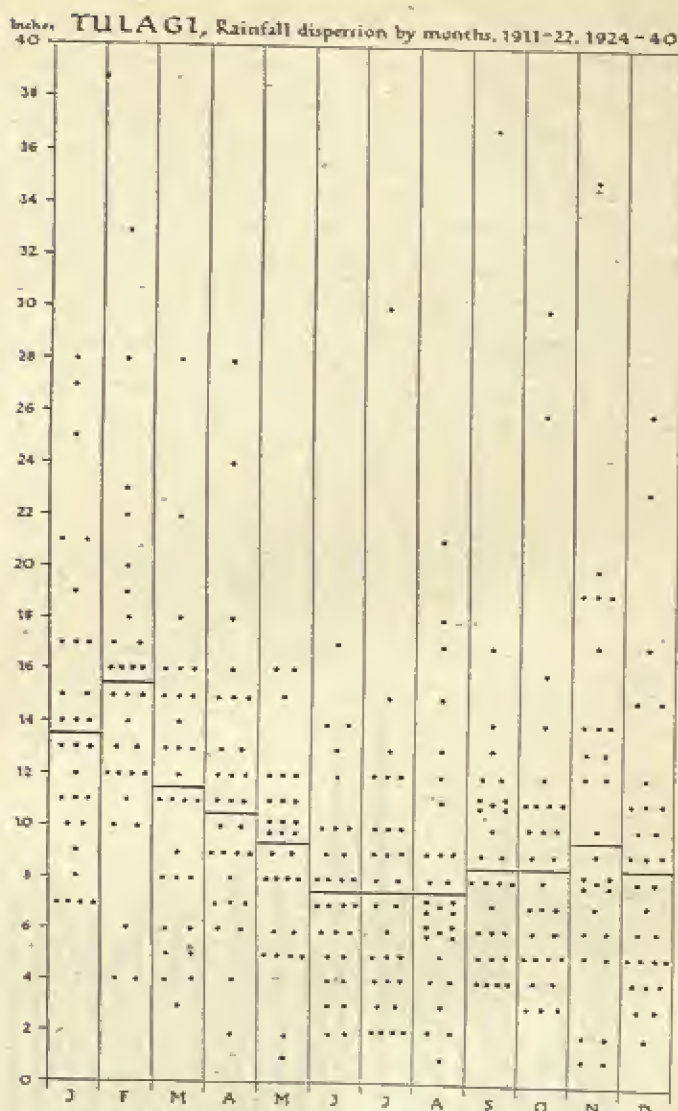


Fig. 205. Rainfall dispersion by months, Tulagi, 1911-22, 1924-40

Based on: (1) *Handbook of the British Solomon Islands Protectorate* (2nd edition, Suva, 1923); (2) *British Solomon Islands Protectorate Blue Book for 1924-40* (Suva, 1925-40).

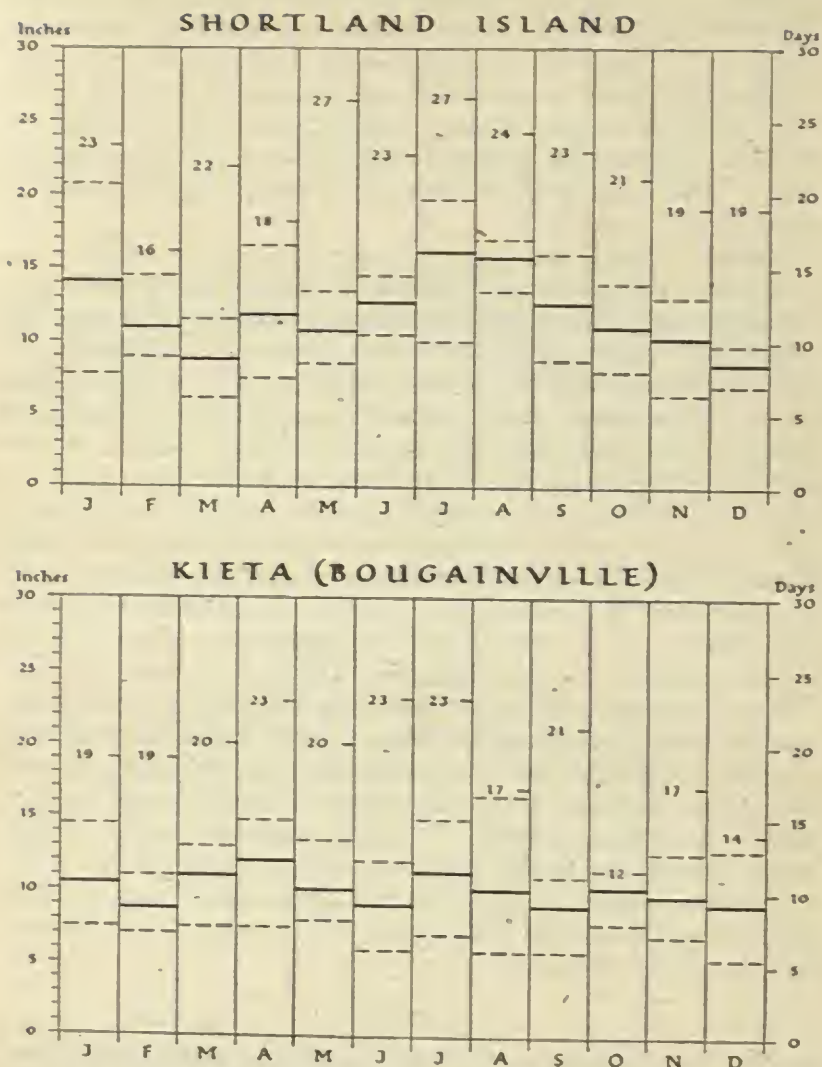


Fig. 206. Rainfall dispersion and rain-days at Shortlands and Kieta

The solid horizontal line across each column represents the mean rainfall for each month. The pecked lines delimit a 50 per cent. dispersion of rain, i.e., there is an even chance that rainfall in any month will fall within the zone so delimited. The tick with attached figure in each column shows the average number of rain-days in each month. Figures for Kieta are based on 19 years' observations; the period of observation at Shortland island is not known. Based on an official source.

between 81° F. and 82° F., but there is an appreciable seasonal difference in the range between absolute maxima and minima—a range which is least in June and greatest in the months November to March. However, temperatures rarely exceed 89° F. or fall below 76° F. Ground temperatures may show a greater range. Maximum readings taken on the grass plain of north-eastern Guadalcanal in 1935 ranged between 80° F. and 105° F. and minimum readings between 55° F. and 76° F.

Rainfall is heavy throughout the year. The average annual figure at Tulagi, a sea-level station somewhat sheltered from the south-east trades, is 128 in. for the period 1899-1939. Annual totals over the period 1911-40 (Fig. 204) have varied between 62 and 230 in. On the windward side of high mountains, the average annual rainfall is probably as much as 240 in. On the small islands of Olu Malau (Three Sisters) 220 in. has been recorded. In the lee of the mountains, as on the northern plain of Guadalcanal, an annual figure as low as 45 in. has been noted. Seasonal changes in rainfall vary with localities. At Tulagi, monthly averages over the period 1899-1939 show a maximum fall of 16 in. in February and a minimum fall of 7 in. in June. Averages of 10 in. and over occur only during the period from November to April and in July. The degree of variation of mean monthly totals from these averages is shown in the dispersion diagram (Fig. 205). On Shortland island, exposed to the south-east and sheltered by Bougainville from the north-west monsoonal rain, maximum rainfall occurs in the south-east trade season of July and August. In northern Bougainville maximum precipitation is brought by the north-west monsoon. At Kieta, sheltered by the Crown Prince range, there is little seasonal variation (Fig. 206).

Relative humidity is high and very constant. Monthly averages for readings at 0900 hr. range from 78 per cent. in December to 83 per cent. in February.

SOILS

Soils in the Solomons are of three main types—those formed from volcanic rocks; those formed from limestone; and the alluvial deposits of deltas and valley floors. The first as the result of heat and abundant rainfall have become more or less laterized. In some areas, as in the interior of Buka (Fig. 201) or on some parts of Nggela, there are extensive superficial deposits of laterite. These support only a sparse vegetation, often of cane grass. Elsewhere, where laterization has not proceeded so far, the volcanic soils are very

fertile and suitable for such crops as coffee and cocoa. Soils formed from coral limestone tend to be coarse in texture with abundant coral fragments. The lime content of samples analysed has not been higher than 1.7 per cent. Coconut palms flourish in this soil, as for example in the Russell islands. The alluvial soils have so far received little attention from agriculturists. Areas where they occur are often either waterlogged or subject to periodical flooding.

VEGETATION

The vegetation of the Solomon islands has been very incompletely investigated, but in general it seems to be like that of the New Hebrides, New Guinea and Indonesia. The larger islands such as Bougainville and Buka, when seen from the sea, appear to be covered up to the highest peaks with a uniform green covering of tropical rain forest. In fact, forest does cover a large part of the surface, but as well as the clearings of the natives, there are areas of scrub and *alang-alang* grassland with very few trees.

Where the coast is low-lying and the substratum is mud or coral the outer vegetation on the seaward side is usually mangrove forest. In many places, especially near the mouths of the larger rivers, the mangrove spreads out into a wide belt and most of the smaller islands are completely encircled with it. The chief trees of the mangrove forest are *Rhizophora*, *Bruguiera* and *Avicennia*, and on them grow orchids and other epiphytes. The interior of the mangrove forest is silent and gloomy with little undergrowth to conceal the black mud and dark turbid water. Up the larger rivers the mangrove gradually merges into a pure growth of the stemless *nipa* palm.

Flat sandy shores are overgrown with the creeping goat's-foot convolvulus, *Canavalia* (belonging to the pea family), and other low-growing plants, which are often covered with tangles of the yellow-stemmed parasite *Cassytha*. Farther back there is usually a narrow belt of casuarina, the delicate twigs of which are constantly moved by the breeze. In some parts of the coast the shore is lined by coconut palms (Plate 119), but in many other parts, especially in sheltered sandy bays, there is an almost impenetrable wall of beach forest. *Calophyllum inophyllum*, *Terminalia catappa*, *Barringtonia* and other trees here grow to a vast size, leaning over the water and knitted together into a solid mass by dense growths of creepers. Epiphytes are found in great numbers, among them the curious species of *Myrmecodia* and *Hydnophytum*, the prickly stems of which

are swollen to the size and shape of a vegetable marrow and are honeycombed by cavities inhabited by ants. The beach forest is perhaps more luxuriant and richer in species in the Solomons than anywhere else in the Pacific. The natives often deliberately refrain from clearing it as it effectively screens their villages from the sea, a wisp of smoke being often the only indication of human inhabitants. Where the coast is rocky there is a similar forest, but more inland species are found mixed with the shore trees. The palm-like *Cycas circinalis* is common in such places.

The rain forest of the Solomons up to 1,000 ft. or more above sea level is tall and magnificent, the average height of the highest storey being 150 ft. or more. Its general aspect is similar to that of the rain forest of New Guinea and Malaya. A vast number of different species of trees grow mixed together, many having huge buttresses. Species of fig (*Ficus*), particularly the gigantic banyan figs with their strange-looking cones of aerial roots, species of nutmeg (*Myristica*), *Canarium* (which provides an edible nut used by the people), and *Eugenia* are particularly common. Woody lianas grow everywhere. *Licuala*, *Areca*, and other small palms are conspicuous in the undergrowth. The forest floor is covered with gingers and other tall herbaceous plants. On serpentine soils there are patches of *alang-alang* grassland with occasional casuarina trees.

Little is known about the mountain vegetation. On exposed ridges at 1,000-1,400 ft. the forest often opens out and gives place to thickets of bramble (*Rubus Hasskarlii*), with long straggling shoots 20-30 ft. long. Only grass and a few stunted trees grow mixed with it. At about 1,000-1,100 ft. on Fauro and Treasury islands brakes of bamboos 40 ft. high have been met with. Tracts of newly deposited volcanic ash become covered with *alang-alang* grass, with patches of low bushes in the gulleys which the heavy rain soon carves out. In the actual craters *alang-alang* and various ferns are the pioneer plants.

Round the native villages there are remarkably tidy, well-kept plantations of taro and other crops enclosed by palisades. No manure is put on the fields and the soil soon becomes exhausted. Fresh forest land is then cleared and the old field abandoned. Secondary rain forest of quick-growing soft-wooded trees soon occupies the site, and thus it happens that the villages are surrounded by a belt of secondary rain forest much larger than the area actually under cultivation. Under some conditions the old cultivated land is invaded by the *alang-alang* grass. The villages themselves are half-buried in

banana, papaya and breadfruit trees and coconut, sago and areca palms. The betel pepper (*Piper betle*), which provides the hot-tasting leaf which is chewed with the areca nut, is grown in every village. Many ornamental plants, particularly hibiscus, with its bright red or yellow flowers, and crotons, plants with gaudily variegated leaves, are grown by the natives, who are fond of decorating themselves with coloured fruits, leaves and flowers.

Like many inhabitants of the tropical rain forest, the Solomon islanders have a remarkable knowledge of the plants of their country and have names for a very large number of trees and other plants, including many which are apparently of no use to them.

FAUNA

The fauna of the Solomon islands is intermediate in type between those of New Guinea and the New Hebrides, with fewer species than the former and more than the latter. The wide gap of deep sea between San Cristobal and the Santa Cruz group is a barrier that has affected markedly the distribution of species within the Solomons. The islands to the west of this division have faunal affinities with New Guinea and those to the east with Fiji and even Queensland.

Among mammals, the cuscus (*Phalanger orientalis breviceps*) represents the most easterly extension of the marsupials. Of bats there are at least 17 species and sub-species. The 5 native species of rats include the large tree-dwelling *Cyromys gigas* and *Mus rex*; the latter has a body up to 14 in. long exclusive of the tail. The only other land mammals of importance are the domesticated species of pigs and dogs. The pig is the small type, seldom more than 3 ft. long, common to most of Melanesia and Polynesia. The Solomon islands wild dog, which is being rapidly absorbed and crossed with dogs imported from Sydney, may well be a descendant of the Australian dingo.

The birds are largely Asiatic in origin, though some types common in the islands nearer to that continent are absent. In general, they belong to types found widely in New Guinea and other islands to the west. Among the most striking are fruit pigeons with metallic green and purple plumage, which abound in every island. Brilliant parrots are also common and include a cockatoo, the Cardinal lory and several beautiful pygmy parrots. Among larger birds are horn-bills, an eagle and an osprey. River and shore birds include several species of kingfisher, herons, and the duck *Anas superciliosa*.

Reptiles comprise 6 species of snakes and 17 of lizards, including the monitor lizard (*Varanus indicus*) and several skinks. The Australian crocodile (*Crocodylus porosus*) is abundant in both salt and fresh water; attacks on natives are known, but its main diet appears to be fish with an occasional cuscus or pig. Among batrachians are various horned and tree frogs and the immense frog *Rana guppyi*, which weighs up to 2½ lb. and frequents the neighbourhood of streams and rivers.

Insect life is abundant. In the main group it is of the type met with in Australia and Malaya; in Santa Cruz it is of Fijian type. Butterflies are somewhat less spectacular than those of New Guinea, but nevertheless include several of the giant bird-winged species. The 29 species of mosquitoes include *Anopheles punctulatus*, a carrier of malaria; it is common in European houses, since screening and nets are often inadequate, and also in native dwellings, though smoke from fires provides some control. Flies are abundant. House flies, which were apparently unknown in 1911, are now very common, particularly on plantations where cattle and horses are kept.

HISTORY

Discovery

The Solomon islands were discovered by the Spaniard Alvaro de Mendaña during his search for the southern continent. On 7 February 1568 the companies of his two ships came in sight of the mountains of Ysabel, which they supposed to be the fringe of the continent itself. Inland exploration soon showed the falsity of this surmise, but, still hoping to make the great discovery, they built a light brigantine in which to penetrate further into the reef-strewn seas. The coasts of Ysabel, Guadalcanal, Malaita and San Cristobal, and of many of the smaller islands, were then carefully explored and the resources of the islands examined.

Conflicts with the natives were frequent—mainly owing to the Spaniards' looting of food supplies; but when fairly treated the people showed themselves generally well disposed towards the voyagers. The land itself appeared exceedingly fertile, and on Guadalcanal the miners who had accompanied the expedition believed they had found signs of gold. After six months in the islands Mendaña was forced through lack of supplies to sail for home; but he did so with the full intention of returning.

In Peru rumours of the wealth of the 'Islands of Solomon' spread

quickly, but it was nearly thirty years before Mendaña was able to carry out his intention. In 1595, however, he sailed again from Callao, with four ships carrying settlers for the foundation of a colony. Before they were half-way to their destination the voyagers were expecting to sight the Solomons, for on the previous voyage the distance of the islands from the American coast had been underestimated by 2,000 miles. At last a large island, inhabited by people resembling those Mendaña had previously known, was reached. They had still failed to find the Solomons; but, abiding by the wishes of the majority of the prospective settlers, Mendaña determined to proceed no further. The island (Ndeni) was given the name of Santa Cruz; and on the shores of Graciosa bay land was cleared and houses built. Soon, however, serious conflict developed with the natives. Then disease appeared, and Mendaña himself was among the many who died. Two months after their arrival the surviving leaders gave the order for the abandonment of the settlement.

Eleven years later, in 1606, Quiros (who had served as chief pilot under Mendaña in 1595) sighted Taumako and Tikopia. Ontong Java was approached by Le Maire in 1616 and by Tasman in 1643. But the main groups of the Solomons and Santa Cruz islands remained unvisited again till the latter part of the eighteenth century. Then, in 1767, Captain Philip Carteret anchored at Ndeni and passed close to Malaita and Buka. Twenty-one years later Lieut. Shortland, bound from New South Wales to China, coasted San Cristobal and Guadalcanal. Neither of these navigators recognized that they were among the islands which had been discovered by Mendaña. That identification was finally made by the Frenchman D'Entrecasteaux, in the course of his unsuccessful search for the lost explorer La Pérouse in 1793.

La Pérouse had, in fact, entered the outskirts of the Solomons in 1788; and his ships had been cast away on Vanikoro, where some members of their companies lived, unknown to Europeans, for many years. Despite much speculation in France and the active interest of many navigators in the Pacific, their fate remained unknown until, in 1826, Peter Dillon discovered a silver sword-guard on the neighbouring island of Tikopia, from which adventurous Polynesian seamen had made occasional voyages to Vanikoro. This led him on to a complete unravelling of the mystery.

The Beginning of Trade

During the first quarter of the nineteenth century the Solomon islands were visited only occasionally, and few ships established any contact with the shore. But by about 1830 sperm whalers had begun to work the surrounding waters. They frequently anchored in the bays of Malaita, San Cristobal, New Georgia, and other islands. A limited traffic in coconuts and other local produce sprang up with the natives, and an occasional European abandoned his ship or was put ashore. During the same years the traders in *bêche-de-mer*, 'tortoise' (turtle) shell, and similar island products, who had hitherto worked in the islands farther east, turned their attention towards the Solomons. Few Europeans yet settled on shore for any length of time; but schooners anchored for considerable periods—notably round the coasts of the New Georgia group and at Sikaiana—for the purposes of trade. By 1851 the Solomon islands were sufficiently well known for the Australian adventurer Benjamin Boyd (of the *Wanderer*) to consider them as a possible site for a European colony which he desired to establish and rule over; he was killed when he landed on Guadalcanal.

Establishment of Missions

The first missionaries to enter the Solomons were members of the Roman Catholic order of Marists in 1845. Several of their number, however, including their leader, were killed on Ysabel and San Cristobal within a comparatively short time of their arrival; and the mission was abandoned, not to be resumed for over fifty years.

In 1850 the Australasian Board of Missions was formed, under the leadership of G. A. Selwyn, Anglican Bishop of New Zealand, for the support of a Melanesian Mission. In the following year Selwyn made the first of a number of visits to the Solomons, establishing friendly relations with the people of many islands and taking young men back to New Zealand for training as catechists. In 1861 the islands within the field of the mission were formed into a separate bishopric, and John Coleridge Patteson was consecrated first Bishop of Melanesia. Patteson's murder by the natives of Nukapu, in the Reef islands, in 1871, greatly shocked public opinion in the Pacific and beyond; but it did not stop the expansion of the mission. In 1895 a central school was established at Siota; and from this time the Solomons became increasingly the main field of the Melanesian Mission's growing activity.

The Labour Trade

When, between 1860 and 1865, settlers in Queensland and in the more advanced areas in the Pacific islands began to import labourers for work on their plantations, the Solomon islands were one of their sources of supply. Until about 1875 the number of Solomon islanders who left their homes in this way was comparatively small; but after that time it greatly increased. All parts of the group, from Buka and Bougainville to the Santa Cruz islands and Tikopia, were visited by the labour traders; but the most important single source of supply of labour then (as now) was the island of Malaita.

The evils of the traffic, and the abuses to which it was open, were generally similar to those described in the section on the New Hebrides (p. 530). Recruiters frequently resorted to force and fraud; and the natives—particularly round the coasts of Malaita—often retaliated by attacking ships and murdering their crews. So uncertain were relations between Europeans and natives that ships were nearly always protected with boarding nets, and boats going ashore from them were kept covered by rifles. Of particular importance in the Solomons was the frequent necessity for 'bush' natives in the larger islands to pass through the lands of their 'saltwater' enemies, if they desired to offer themselves as recruits; this was a frequent cause of hostilities. In general, however, the Solomon islanders suffered less catastrophically than did the people of the New Hebrides. Before the traffic with the Solomons had reached its full development both Queensland and Fiji had succeeded in imposing some measure of control. The recruits themselves, once they were on board the labour vessels, were likely to receive tolerable treatment; on the plantations they were sure of their wages; and the respective governments provided for their return home at the end of their period of indenture. Only the comparatively small numbers who were recruited for the Torres strait pearl fishery or for the plantations of Samoa were likely to be seriously maltreated and defrauded during their period of work.

In 1904 recruiting for Queensland, to which by that time most Solomon islanders were going, was brought to an end. In 1906 mass repatriation was begun. For many who had abandoned their former way of life the enforced return was a severe blow; and a considerable number of children born in Queensland and brought up with Europeans failed to survive the rigours of life in the islands. But, on the whole, the repatriation was conducted with skill and marked

the beginning of a new phase in the penetration of Melanesian society by European ideas and technique.

The Copra Trade

About the same time as the establishment of the labour traffic Europeans had begun to settle in the Solomons as traders. A few, such as Lars Nielsen of Gavutu, William Macdonald of Santa Ana, and several settlers on the Roviana lagoon, possessed schooners manned by native crews, and carried on trade over a considerable part of the group. The majority, however, were former sailors who had arrived in the islands with no resources and were content to earn a meagre livelihood in the district in which they lived, often by acting as agents for the larger traders.

Among the articles of trade were *bêche-de-mer*, turtle shell, pearl shell, and, after about 1880, ivory nuts. The principal demand, however, was at first for coconut oil. This was prepared in the Solomons by scraping out the flesh of the nuts, and then boiling it in water so that the oil rose to the surface and could be skimmed off. After 1875 there was a gradual transference to copra, the preparation of which required even less exertion. The flesh of the coconuts was cut in half, dried in smoke houses, and threaded on strings. Each string was supposed to contain 20 half-nuts, and 10 strings were tied together to form a bunch; about 100 bunches made up a ton. This quantity of copra was sold by the natives to the traders for about £3, or—reckoning in the common currency of the islands—40 lb. of tobacco. But most of the price was taken in trade goods, and to be successful the trader had to know accurately what was wanted by each group of his suppliers—axes, some particular kind of knives, or wax matches—and at the prices ruling on the world market during most of this period the margin of profit was not large. Few traders can often have made more than £200 or £300 a year from their dealings in copra.

The Intervention of Britain and Germany

After about 1880 the new interest of the Western Powers in the potential strategic and economic importance of the Pacific islands began to affect the Solomons. In 1886 Britain and Germany agreed to delimit their respective spheres of influence between the longitudes of western New Guinea and Samoa. By this agreement the northern Solomon islands, including Bougainville, Buka, Choiseul

and Ysabel, were placed within the German sphere and the remainder of the group within the British sphere.

German interest in the Solomons had until that time been negligible. The raising of the German flag on Choiseul in 1885 had represented an extension of the existing German sphere in New Guinea and the Bismarck archipelago rather than the creation of a new centre of colonial activity. Britain, on the other hand, had for many years been forced to send ships-of-war to the group to keep order among the labour traders and also to punish natives who had wantonly ill-treated British subjects. Several incidents—notably the murder of Commodore Goodenough at Graciosa bay in 1875 and that of Lieut. Bower of H.M.S. *Sandfly*, while surveying the coasts of Nggela in 1880—had drawn public attention to the inadequacy of this desultory intervention. The creation of the Western Pacific High Commission in 1877 (p. 171) had marked a determination to place it under regular central control; but this was not in itself sufficient. In 1893 a British protectorate was proclaimed over the major islands of the southern Solomons, including Guadalcanal, Malaita, the New Georgia group and San Cristobal. In 1898-9 this was extended to the remaining islands, including the Santa Cruz group and neighbouring islands.

In 1899 the situation in Samoa (vol. II, p. 598) led to another Anglo-German agreement on Pacific islands affairs. As one of its terms, Ysabel, Choiseul, Ontong Java and the islands of Bougainville strait were transferred from Germany to Britain. This division remained effective until on the outbreak of war in 1914 Australian troops occupied the islands still under German control.

Internal Development since 1890

In 1896 C. M. Woodford, who had already spent a considerable time in the Solomons as a naturalist, was appointed Resident Commissioner of the islands under British protection. He held office as a subordinate of the High Commissioner for the Western Pacific. For many years his principal duties were those of putting an end to native warfare and of arresting malefactors. He showed great skill both in gaining the confidence of native chiefs and in retaining the co-operation of European settlers. Gradually additional officers were appointed to assist him. His two most difficult areas were New Georgia, where head-hunting raids were still being carried out, and Malaita, where warfare seemed endemic and the life of Europeans to be constantly in danger. To deal with these problems, a govern-

ment station was established at Gizo, in the New Georgia group, about 1899, and another at Auki, in Malaita, in 1909. By about 1914 the pacification of the islands seemed to be on the point of completion. The outbreak of war in Europe, however, led to new waves of lawlessness, notably on Malaita, owing to the enforced restriction of government activity. When Woodford retired in 1918, a considerable amount of his work seemed to have been undone.

The task of restoring control was arduous and not quickly completed. In 1922 it was stated officially that half the island of Malaita was in a condition of semi-lawlessness. In February 1927 three native constables were killed by 'bush' natives on Guadalcanal, and in the following October the District Officer for Malaita, an administrative service cadet, and 13 natives were killed near Sinarango, on Malaita. Stern measures were taken, and both islands were again under complete control by the beginning of 1928. Other parts of the protectorate, however, still remained in a more backward state. Only in 1941 was the last of the major islands, Choiseul, brought under full administrative control. In the former German Solomons there are still areas which have never been fully administered (p. 651). More recently, developments of the present war (p. 711) have again caused an interruption in peaceful administration.

The years in which the Solomons were first being brought under administrative control also saw the beginning of a new phase in missionary development. In 1898 the Marist mission was re-established—first at Rua Sura, and then gradually throughout the group. In 1904 a Solomons branch of the Queensland Kanaka Mission was formed, in response to the requests of men returned from labour on the plantations. It began work (under the name of South Seas Evangelical Mission) on Malaita, from which it later extended to San Cristobal and Guadalcanal. In the western Solomons the Methodists began work in 1902 and the Seventh Day Adventists some years later. Meanwhile, the continued development of the Melanesian Mission culminated in the removal of the mission's headquarters from Norfolk island to Siota, on the island of Nggela, in 1919.

Similarly, the years round 1900 marked the beginning of a new phase in the economic development of the group. In 1898 Lord Stanmore (formerly Sir Arthur Gordon, Governor of Fiji, p. 137), chairman of the Pacific Islands Company, asked for a lease of the unoccupied parts of New Georgia and certain other islands. The company suggested that it might be entrusted with the general

control of economic development in the British Solomon islands and temporarily with their administration. This proposal was turned down, but in 1903 the company was given a lease for 99 years of 193,000 acres of land scattered throughout the protectorate. The company later disposed of its properties to Lever's Pacific Plantations, which firm has continued to develop them. At the same time smaller firms—such as the Malayta Company—and private planters began to take up land. During the past thirty years the economic development of the Solomon islands has depended primarily upon copra produced on these European-owned estates (p. 656).

PEOPLES

DISTRIBUTION AND TRENDS OF POPULATION

The native population forms by far the majority of the inhabitants of the Solomons. The total for the group, comprising the protectorate and the mandated islands, is difficult to assess, but was probably about 145,000 in 1940. Except in several marginal islands to the north, east and south of the main group, the native people are of Melanesian physical type. In these outer islands they are Polynesian. In addition to the natives there are a small number of Europeans and Chinese.

The latest figures for the protectorate, those of the 1931 census, are as follows:

Europeans	478
Melanesians	89,568
Polynesians	3,847
Chinese	164
Japanese	8
Malays	1
Total	94,066

Based on *Report of the 1931 Census*, p. 23 (unpublished, Tulagi).

Figures of native population alone are available for the islands within the Mandated Territory of New Guinea. In 1940 this population totalled 49,067. Kieta, the administrative centre of this area, had in 1933 a non-native population of 22 Europeans and 35 Asiatics. As in the protectorate, small numbers of Europeans are scattered through the mission stations and plantations.

All the above figures cannot be considered as absolutely accurate, since reliance is placed largely upon native enumerators and some areas are still only under partial government influence.

The history of native population trends in the Solomons is largely speculation, based on general impressions by early traders and missionaries and aided by parallels drawn from other parts of the Pacific. In general it can be inferred that from about 1870, when European influence first became appreciable, until the present day a steady decline has occurred. 'Blackbirding' effected reduction in two ways: first, through losses caused by recruiting and the bloodshed that accompanied it; and, second, by the accompanying trade in firearms, which resulted in intensified inter-group warfare. But introduced diseases, particularly tuberculosis and dysentery, have taken heavier toll, especially among the Polynesians, who seem less able to resist them than do the Melanesians. Other factors making for population decline may have been the break-up of native social institutions caused by trade and mission influence and resulting in a loss of interest in life. Most modern investigators, however, consider that this factor is of minor importance. Substantial factors arresting the decline have been the development of medical services and the suppression of warfare, head-hunting and personal feuds.

The general effect of European contacts on the Polynesians is clearly seen by a comparison of population trends in Ontong Java, where European traders and missionaries have been in close touch with the population for forty years, and Tikopia or Rennell, where such contacts have been much fewer and in recent years have been restricted by the government. In Ontong Java a steady decline has set in: in 1907 the total was estimated at 5,500, but by 1939 it had fallen to 588—a decrease of nearly 90 per cent. in thirty years. The introduced diseases of tuberculosis and malaria are mainly responsible for this threatened extinction of the Ontong Javanese. On Tikopia there is evidence that the population is reaching the limit that the island is capable of supporting without an appreciable increase in the food supply. Celibacy, contraception and female infanticide have long been employed by the natives to prevent over-population, but these checks have ceased to operate so extensively since about half of the people accepted Christianity some 25 years ago.

Density of population in the group as a whole averages 8 per sq. mile. Densities on individual islands vary enormously. In 1931 the figure was 2 per sq. mile on Vanikoro and Tevai, where depopulation has been severe, on Guadalcanal 6, and on Buka 40. Malaita and Bougainville, with the largest populations in the group, have average densities of about 27 and 100 respectively. Tikopia is possibly the



Plates 97 and 98. A young man of Ontong, Java
An example of the Polynesian physical type met with in some of the marginal islands.



Plate 99. Native drilling shell-money

He is using a pump drill to make a central hole in each shell disc. The discs are then threaded on a string.



Plate 100. Native of Santa Catalina

A fine example of the Melanesian type predominant among Solomon islanders. Note the shell disc placed in the pierced and distended lobe of the ear and the necklet of teeth and shell discs.

most densely populated island in the whole group. One estimate puts its density at about 400 people per sq. mile.

Population distribution on the larger islands has changed greatly over the last eighty years. In the latter half of the last century and perhaps for many generations before, there were intermittent feuds between the coastal peoples and those of the interior. Head-hunting raids by the 'saltwater' folk depopulated the more accessible interior settlements, while retaliatory raids by the 'bush' folk caused concentration of settlement on small islands, both natural and artificial, in the coastal lagoons. Thus coastal settlements tended to be grouped in such areas as the Langalanga and Roviana lagoons with defensible village sites. Elsewhere there were few villages on coasts open to attack. Similar conditions prevailed during the 'blackbirding' era when coastal peoples tended to trade 'bush' prisoners to Europeans. Since 1900 the government and the missions have fostered a drift towards the coast. Head-hunting came to an end with the destruction by government of the Roviana head-hunting canoes; the general establishment of law and order ended the feuds between coasts and bush peoples; and the desire for fish and trade goods attracted many of the inhabitants of the interior to the coast. Missions, too, placed their first stations and schools in coastal villages and found it easier to persuade converts to settle in their neighbourhood than to set up additional stations in the interior. The result of these tendencies can be seen, for instance, on Guadalcanal, where nearly all the 14,000 inhabitants live on the coast, and on San Cristobal, where by 1919 it was reported that few villages remained in the interior of Arosi district. Coconut estate areas are not so extensive as seriously to affect population distribution. Government policy both in the protectorate and the mandated islands has ensured that where land has been obtained from natives, adequate native reserves have been established in the vicinity of estates.

THE NATIVE PEOPLE

Physical Appearance

With the exception of the Polynesians noted above, the Solomon islanders are physically of Melanesian type (Plate 100), with dark skin, medium height (about 5 ft.) and long head (the average cephalic index in Bougainville mostly varies between 75 and 77). In the north-western islands of Buka, Bougainville and the Shortland group, skin colour is as black as that of the blackest

African negro. South-east of this region there is a steady diminution in skin pigment; the Malaita inhabitants are brown rather than black. In facial features they all possess broad noses and thick though not everted lips. Their dark frizzly hair is worn as a big mop, often carrying a comb of fine workmanship.

The inhabitants of the marginal islands in most cases appear to be the descendants of drift voyagers and other arrivals from Polynesia; they are usually of mixed ancestry. Some, like the Tikopia (Plate 17), may be fairly pure Polynesians, but all probably have some Melanesian admixture. It has recently been argued that the Ontong Javanese show more affinities with Micronesians than with Polynesians.

Language

The languages of the Solomon islands show considerable diversity, but the study of many of them is as yet so incomplete that no final classification and grouping of them all can be made. It is clear, however, that like those of the New Hebrides, they fall into three main sets: Melanesian, Polynesian and a third set commonly called Papuan, but which are distinguished by their differences from Melanesian rather than by their likeness to one another. The Melanesian languages are by far the most important and widespread. They are spoken practically throughout all the major islands, from the Santa Cruz group to Buka, and are closely related to the languages of the New Hebrides on the one side and to those of south-eastern New Guinea on the other. The Polynesian languages are spoken in a number of small outlying islands, such as Tikopia and Anuta, Rennell and Bellona, Sikaiana, Ontong Java, Tauu, Taumako and some of the Reef islands; they are clearly the result of immigration of Polynesians from the east, and have fairly close affinities with the language of Tonga, Samoa, the Ellice islands, etc. The 'Papuan' (non-Melanesian) languages have received least study; though they occur in Savo and in Bilua (Vella Lavella), they are spoken mainly by the people of Buin and Siwai in Bougainville and by inland people in the centre and north of the island. They may tentatively be regarded as belonging to people of earlier residence, and probably have their closest affinities with languages in New Britain and New Guinea. But contact between peoples speaking the various types of language has been considerable; many of the Melanesian languages contain some 'Papuan' elements, and there has been some Polynesian-Melanesian admixture—quite apart from the common Indonesian

factors in these two branches. The following remarks deal primarily with the Melanesian languages, as being of major interest for the area.

The Melanesian languages comprise a large number of dialects, which, however, can be grouped into a few main languages on each large island or in adjacent islands. On Buka, for instance, there are 3 dialects, all Melanesian, and on Bougainville at least 10 Melanesian dialects (others, such as Telei, Motuna and Nasioi, are of 'Papuan' type). On Choiseul, 6 dialects have been recorded, all closely related but of a very different group from those of the islands to the south-east. On Malaita there are said to be 18 dialects fairly closely related but falling into about 5 languages. On Ysabel there are about 10 dialects, and probably more on Guadalcanal, while on San Cristobal there are 12 dialects, 7 being comprised in the Arosi language in the north, while the others fall into 2 other languages. Nggela has only one language, and though there are slight phonetic differences in speech in various parts of the island, they are not enough to be classed as dialects.

The various dialects of any one language, and often those of adjacent languages as well, are usually mutually intelligible. In social intercourse between the people, as in trading, each person uses his own speech and 'hears'—i.e., understands—the speech of the other, even though pronunciation and vocabulary may have considerable differences. This is not the case, however, when there is contact between peoples of whom one speaks a Melanesian and the other a 'Papuan' language. The people of Savo, for instance, understand and to some extent use the adjacent speech of Nggela, but the reverse is not the case. The languages of the coastal people of the north of Bougainville and that of the Kunia people of the mountains are mutually unintelligible, and this is one factor in the distrust and hostility they show to each other. Nowadays the increasing use of 'pidgin English' facilitates intercommunication.

Over some wide areas the different languages themselves may be grouped in terms of their close relationship. Thus in the south-east Solomons those of south Malaita, Ulawa, eastern Guadalcanal and San Cristobal form one group, while those of Nggela, northern and western Guadalcanal and Ysabel form another group.

In vocabulary the Melanesian languages of the Solomons are well developed; in the language of Sa'a and Ulawa, for instance, about 6,000 main words have been recorded, with a large number of derivatives in addition. Incidentally, the stability of the languages has been

shown by comparing words collected by Mendaña in 1568 with those in use at the present day. The comparison shows that the former—the first records of Melanesian speech ever made—after allowance has been made for differences in orthography and occasional errors in identification of objects, can be identified in nearly every case with modern words.

In general structure the Melanesian languages of the Solomons are very similar to those of the islands to the south-east; the principles already illustrated in the case of Fiji (p. 149) broadly apply. Phonetically, they are similar in general to those of the New Hebrides, though less so in the north-west than in the south-east. The nasalized plosive *m*, for instance, so characteristic of the New Hebrides, occurs from Santa Cruz to Guadalcanal, but is not found in Nggela or the islands westward of it; and the dialects of Choiseul have a larger number of palatal sounds than do the languages to the south-east. A number of the languages, e.g., those of Nggela, of Sa'a and Ulawa, and of Roviana, have been reduced to writing, especially in the form of dictionaries and religious literature. The same difficulties of orthography have occurred as in the New Hebrides, though considerable uniformity has been achieved by the Melanesian Mission in the south-east and the Methodist mission in the west.

The small range of many Solomon islands languages and dialects has necessitated the development of some form of *lingua franca*. In the south-eastern islands the Melanesian Mission, while printing many prayer-books, etc., in the vernacular for local use, long ago adopted Mota, the Banks islands language, as a general medium of communication, thus linking their Solomons work with that in the New Hebrides. Most other Europeans, however, including government officials and traders, used 'pidgin English', which attained a more general currency, and of recent years the Melanesian Mission has tended to turn to English as well.

Culture

There are marked regional and local differences in the culture of the natives of the Solomon islands. The most significant is that between the Melanesian culture of most parts of the group and the Polynesian culture of the outlying islands, which broadly speaking is of the same general type as the culture of the people of Tonga and of Uvea and Futuna (Chapters II and VII). Some account of the Polynesian cultures is given in the description of individual islands (pp. 669, 692, 696-7).



Plate 101. Gamal house, south-east Solomon islands

One of the few remaining examples of the men's houses erected in pagan days, and functioning partly as temple and partly as club-house for the men. Figures connected with the ancient cults are carved on the posts.



Plate 102. Carved posts from an old gamal house, Ugi

The modern buildings are dwelling houses of the type erected nowadays under European influence.



Plate 103. Islet of Tendao, off Vella Lavella

On the mainland is a gurnal house. On the small islet to the left is a small skull house (a shrine to hold the skulls of ancestors).



Plate 104. Sisieta village, Roviana lagoon

Native houses of traditional type. The thatch over the 'verandah' behind the figures is of a local 'flounced' pattern.

On a basis of differences of language, kinship terms and social organization, several Melanesian culture areas can be broadly distinguished: (i) the Santa Cruz group; (ii) Malaita, Ulawa, San Cristobal and eastern Guadalcanal; (iii) Nggela, Savo and the rest of Guadalcanal; (iv) Ysabel and the New Georgia group; (v) Choiseul, Treasury, the Shortlands, Bougainville and Buka.

Houses and Villages

In general, native houses throughout the group follow a rectangular plan with a span roof (Plate 102). Some of the larger and better-built houses measure about 25 by 15 ft., but most are rather smaller. Local materials are normally used; the almost invariable roof covering is sago palm leaf thatch. Walls may be of thatch or of interlaced bamboo. The framework and rafters are of light poles. In areas where European influence has been greatest, corrugated iron and sawn planks are sometimes used. Houses frequently possess a verandah at one end protected by the overhang of the main roof or by a separate awning-like thatch (Plate 104). Women's houses in Malaita have a kind of semicircular apse at the end, forming both living-room and entrance. Doorways formerly were openings only 2 or 3 ft. high so that enemies had to stoop to enter and would thus be taken at a disadvantage. Nowadays they are usually of normal height.

In general appearance village public buildings—men's houses and canoe houses—are merely larger and more elaborate versions of dwelling-houses in their design and in the materials employed (Plate 101). But the framework is of stouter timbers and is often elaborately carved and painted with human and animal figures prominent in the local religious cults. In areas under mission or plantation influence villages are laid out with houses in straight rows. Elsewhere there is usually no definite system of alignment, though in the north of Bougainville and in Buka houses are grouped in lines about a central dancing space.

Village sites are often changed at intervals of a few years. Apart from the general drift of population towards the coast, the most important factor is soil exhaustion in the village yam gardens and taro patches, compelling a move to a new site. On the coast, village sites are chosen for nearness to fishing grounds and need for shelter and landing places for canoes (Plate 107). They therefore tend to be permanently occupied. Formerly they were also determined by considerations of defence. The size of villages varies very greatly. The

'bush' peoples live in small isolated settlements—frequently of only two or three houses—situated formerly on some commanding ridge or in modern times near a stream. Such hamlets occur every few miles in some areas. Coastal societies tend to be organized on a larger scale, and problems of defence have tended to determine the size of villages. In the coastal lagoons of Malaita, artificial islands (Plate 103) have been built up from coral boulders on shoal patches. The commonly held view is that these islands were built as refuges from raids by 'bush' folk; one opinion, however, is that warfare was a nineteenth-century development and that they were built to avoid mosquitoes and other pests of the foreshore. The labour of building and the shortage of materials have meant that additions to their size have not kept pace with growth of population; a crowded jumble of dwelling-houses, men's houses, sheds and pig-pens covers each island. Nevertheless, space is found for dancing grounds and cemeteries. One, Sulu Vou (Sulu Fou), on the north-east coast of Malaita, had an estimated population of 300 in 1927.

Social Organization

The only social unit common to the whole of the Solomons is the individual family of parents and their children. In Buka and Bougainville, parents and young children live together, while adolescent boys and bachelors sleep in the village men's house. In the interior of Malaita, married men too sleep in the men's house. Family ties and duties are everywhere important. Economically, the family is the main producing and consuming unit except on major social occasions; in the native religion the most powerful of the ancestral spirits to which a man prays are those of his immediate ancestors.

Individual families are usually organized in larger kinship groups. In the interior of Malaita, these larger units are composed of people tracing descent from common ancestors equally through male and female lines. The few households in each hamlet are all related to one another on this basis. The apparently similar hamlets of 'bush' dwellers elsewhere are of similar size but are very different in terms of kinship. In Bougainville, Ysabel, Nggela and northern Guadalcanal, they consist of local sub-divisions of matrilineal clans. The clans themselves are large, intermarrying and widely distributed groups. Thus in Guadalcanal the same clan may include among its members villagers spread over most of the island. Apart from the regulation of marriage, the social functions of the clans are chiefly

religious. In addition to the bond of common ancestral spirits, members consider themselves linked by way of these spirits with some animal or bird species (a totem) which they are forbidden to kill or eat. The clans are often named after their totems. The local sub-divisions of the clan are the units of importance in the arrangement of marriages, the organization of ancestor worship and the upholding of law and order. With the conversion of much of the population to Christianity, many of these clan functions have tended to fall into decay.

In pagan areas, betrothal is arranged by the parents while the couple concerned are still children. Young men marry generally between the ages of 18 and 20, though in Malaita, where many at this age are away on the plantations, the usual age is 25 to 30. Substantial presents of shell currency (the 'bride-price') are given by the youth's kinsfolk to those of the girl both before and during the marriage ceremony, which itself is solemnized by an exchange of goods between the two groups.

These arranged marriages often end in an early divorce. Second marriages are generally stable. Rigidity of sexual codes and permanence of marriage differ widely from island to island, as also does the amount of goods given. In Malaita it consists of 220 strings of shell discs, about 200 porpoise teeth and 80 dogs' teeth—a total value of over £60—whereas in Guadalcanal it is of a value of only £1 to £2. Today, destruction of the old taboos by missionaries and the fact that young returned labourers are wealthy enough to finance their own marriages without seeking help from relatives have tended to change the Malaita type of marriage.

Chiefs and Political Organization

In most areas hereditary chiefs are absent from the native political system. In 'bush' hamlets, the local political head is a man who has achieved his position by a greater distribution of wealth than his neighbours. By cultivating larger gardens and accumulating larger herds of pigs than his neighbours a man wins the support of relatives in his enterprise; with their co-operation he builds up his social position by holding vast feasts, with accompanying sacrifices to his ancestors. There is much rivalry between candidates for leadership, and he who can give the grandest feast wins; the old leader loses his position when he has been several times outdone in lavishness. The area over which such a leader holds sway is very small—merely 2-3 sq. miles of bush containing a few hamlets. Where there are clans

a similar system prevails, though the leader is usually also the head of the local sub-clan and owes his position not only to wealth and hospitality but also to his access to the powerful ancestral spirits of the clan. In northern Bougainville one family in each village is recognized as of high rank, and its head is the local hereditary leader or chief. In the Buin area of southern Bougainville a much more rigid class distinction between hereditary chiefs and commoners exists; the chiefs' families are interrelated and constitute an almost feudal aristocracy. Commoners are merely their henchmen, who must support them in pig rearing and in warfare.

The functions of these political heads, whether local leaders or hereditary chiefs, are very wide. In the economic sphere, by organizing competitive feasts they stimulate production to a considerable degree. In the preservation of law and order they are the final arbiters in settling disputes. In inter-group offences, a leader's or chief's sanction was sought for reprisals against neighbouring groups, though he did not take an active part in the fighting. In religion, though the actual sacrifices and intercession with the ancestral spirits are generally performed by a native priest, he is the provider of the pigs for sacrifice and organizer of the accompanying feast.

Land Tenure and Inheritance

The general threefold division of land into bush, garden, and village land is found here as elsewhere in Melanesia. Virgin jungle is of value solely for whatever wild crops and game it may produce. Though no group or individual lays specific claim to it, wild trees such as the canarium almond are claimed by individuals. The act of clearing and planting or building a house on bush land gives the users claims to it. The unauthorized occupation of adjoining bush land would be considered an illegal procedure; for adjacent land always has potential value as garden or village land. A clear distinction is drawn between virgin jungle and fallow areas covered with secondary growth awaiting re-use as garden land.

Shifting cultivation and the relatively short life of native houses have meant that often there are few ties between a man and the land of his ancestors except those of sentiment and religion. The growth of such annual crops as taro and bananas agrees well with this relative impermanence of tenure. But in the case of fruit trees, which have a relatively long life, complications arise in those areas where there are clans. Trees are not owned by the clan but are handed down individually from father to son, while the land on which they



Plate 105. Beach at Pamua, San Cristobal

The canoe is of a type known as *lizi*, with additional freeboard at bow and stern. The designs on it are painted. The Melanesian Mission vessel 'Southern Cross' lies offshore.



Plate 106. Canoe at Roviana

Note the 'fringes' of white cowry shells on bow and stern and the rows of pearl-shell inlay.



Plate 107. Artificial island, Malaita

The boulders of which the island is built show plainly. Of special interest is the view of the interior of the canoe showing how the ribs are lashed to lugs carved out of the solid wood on the inside of the planks.



Plate 108. Petats island: bringing in fish

The hills in the background form the western coast of Buka. The canoe is of the single outrigger type found in the Solomons but commoner elsewhere in the Pacific.

are planted devolves along the normal matrilineal line to a man's sister's son.

Native land throughout the Solomons is held on a family or clan basis. Exclusive individual ownership, as we know it, is foreign to the traditions of the people. Within the matrilineal clan, rights in land are inherited by men from their mothers' brothers. But the nearest approach to individual ownership is found in the interior of Malaita, where a man's rights to land are dependent on the places of burial of his ancestors; he has therefore some choice of district in which to settle according to which of his ancestors he chooses to worship. Inheritance is from father to son. In other islands where the clan system exists, the effective land-holding unit is the sub-clan, and all questions of land administration are dealt with by its head. Families within the sub-clan are left in undisturbed occupancy of their land unless by misdeed they forfeit their clan rights; in such cases or when family lines die out, the ultimate rights of the sub-clan are asserted and a redistribution takes place.

Agriculture, Hunting and Fishing

All the Solomon islanders depend on agriculture and fishing for food. The coastal peoples usually cultivate little, but have developed fishing and the hunting of turtles, dugong and porpoises; the bush folk, with no ready access to the sea, grow a surplus of crops which they exchange for fish with the coastal folk.

The staple food crops of the islanders are taro and yams. The former is in most areas the main crop. The men fell and burn the jungle to make clearings for it and build strong fences to keep out pigs. Planting is done by the women but men share in the subsequent weeding. Taro makes great demands on the fertility of the soil, and once a patch has been cropped it must be fallowed for some years before being again planted. The resulting shifting of cultivation often means that plots are several miles from the homes of the cultivators and at the end of the day the women have a weary trudge home laden with the taro roots. Yams, including the prickly panna type, are grown with their vines trailing over poles set in the ground. Bananas of many varieties and papaya are also cultivated in the garden patches. Breadfruit and coconut palms are planted but given little attention beyond the collection of the fruit.

The organization of gardening is fairly simple. Families cultivate individual plots, often with the assistance of near kin or neighbours. The 'leaders' of bush communities owe their rise to wealth and

power to the number of such extra hands that they can persuade to help them in gardening and pig-rearing. Such work is repaid in the lavish feasts given by the candidates for power. The need for more labour is a powerful incentive to polygyny among such men. In the larger village communities additional plots are planted with communal labour to finance public feasts.

Wild fruits and nuts, particularly the canarium almond, are assiduously collected for food, and ivory nuts, the fruit of *Metroxylon solomonense* (a local sago palm), for sale to traders. Hunting is a relatively minor source of food. Wild pigs are hunted with dogs and spears. The cuscus is captured in holes in trees. Birds are shot with bow and arrow or taken in snares.

Fishing is done by a great variety of methods. Hooks and lines, nets, hooks attached to kite strings, poisons, thorn-lined traps, spears, bows and arrows are all employed by men. Women collect shellfish on the reefs and use hand nets in the lagoons. Bonito fishing provides an important supply of food. This and other types of fishing where there is considerable risk and uncertainty of obtaining a catch are accompanied by elaborate magical ceremonies to ensure success.

Exchange and Currency

The Solomon islanders are typical of Melanesians in general in having highly developed systems of exchange and forms of ceremonial currency. The simple barter of fish for vegetables flourished even in pre-European days, when skirmishes between 'bush' and 'saltwater' people were frequent. At a prearranged meeting point, women from each side bargained, while their menfolk, fully armed, kept a watchful eye on them.

Traces of the old mutual suspicion still linger at such meetings. Other native commodities—mainly local manufactures—are similarly bartered, but in the more ceremonial exchanges, such as those accompanying marriage or in legal compensation for injuries, native currencies are used. These consist of strings (measured in arm stretches equivalent to fathoms) on which are threaded small discs of shell or teeth of porpoise, flying-fox or dog. These strings have acquired definite value in terms of the British official currency which now circulates in limited quantities among the natives. Thus in north Bougainville in 1929 one fathom string of shell discs was worth 5s. and one fathom string of dogs' teeth £5. The shell 'money' in Buka and Bougainville is imported from various parts of the

Bismarck archipelago; that used in the southern and central Solomons is mostly made in the islands in the Langalanga lagoon, Malaita. (Plate 99 shows the method of drilling the holes in the shell discs.)

For the last forty years or more the barter or sale of copra, and the work of men as indentured labourers, have provided the natives with 'trade' goods at stores run by traders and plantation managers. Items ranging from calico, knives, tinned goods and tobacco to electric torches and sewing machines are obtained there; such goods are apt to be poor in quality and dear, the traders excusing high prices on the ground that their purchasers often run up big debts.

Canoes

All who have visited the Solomons—from Mendaña to present-day travellers—have been impressed by the beauty and skilful construction of the local canoes. The distinctive Solomons type, of which there are several local variants, is a single-hulled vessel, plank-built and with ribs to which the planks are lashed by cleats (Plate 107). It is of comparatively light weight and is crescentic in general outline with high bow and stern (Plate 106). In appearance and in method of construction it has some resemblance to the Viking ships of Scandinavia, and contrasts markedly with the dug-outs of the rest of the Pacific. The Solomons canoes were formerly made with stone and shell tools; but for the last sixty years, at least, imported steel adzes have been employed. The seams are carefully caulked with a preparation from the wild 'putty nut' (*Parinarium laurinum*), and in many areas the outside of the hull is painted with designs in black, white and red or inlaid with pearl shell and clam shell on a black ground (Plate 105). Frigate birds and dolphins are favourite motives. The finest examples of ornament come from the San Cristóbal-Ulawa area and the New Georgia group. Canoes vary in size from the 'toy' canoes for children to the large craft formerly used for head-hunting expeditions. These latter, capable of carrying 35 men, were as much as 50-60 ft. long with a beam of 4-5 ft. and a depth of 3 ft. amidships, the bow and stern rising to a height of 12 or 13 ft. Quite long voyages were made on these raids, the New Georgia canoes even going as far as Malaita. Such craft were sheltered from the sun in large canoe houses, which also served as men's houses and held the sacred relics of the community—the skulls of noted ancestors and those of captured enemies.

The more normal type of canoe—the dug-out with single outrigger (Plate 108) and with or without washstrakes—exists in several



areas along with the plank-built types. In the Polynesian islands the former are the only types in use. Nissan has a form with double outrigger. Of recent years there has been a decline in the quantity and quality of canoe output. European-type boats, often bought with the proceeds of copra manufacture, carry more in proportion to their size and are easier to handle.

Other Native Manufactures

In pre-European days the craftwork of the Solomon islanders reached a very high technical and artistic level in many branches. The shell inlay of the kind used on the canoes is also employed on other objects (Fig. 207) carved from soft wood and painted black; among the finest of these are the bowls frequently carved in the shape of a bird and used for food at feasts (Plate 110). Similar inlay was applied to the fronts of ceremonial shields (Plate 109) and to figures representing animal or half-human figures prominent in the local religion. The mythical figure of *Kareimani* (half man, half shark), the frigate bird and the dolphin constantly recur. The little wooden tutelary figures on the bows of canoes in the western Solomons are frequently fine works of art (Fig. 208). Clubs were carved from very hard wood which takes a high polish; those intended for ceremonial were often highly ornamented. Pottery of simple types is made in a few localities in Buka and Bougainville. Among the highest achievements are the fretted discs of turtle shell mounted on larger discs of clam shell attached as a head ornament by a plaited band. With great delicacy of treatment the turtle shell is cut into intricate radiating and concentric patterns.

Fig. 207. Fishing-float from the southern Solomons.

The float is made of wood and inlaid with pearl-shell. The top is carved to represent a bird. The bottom is weighted with a small stone. A dozen such floats are attached to a line provided with baited gorges for catching flying-fish. Length, 2 ft. 9½ in. Drawn from the original in the Museum of Archaeology and Ethnology, Cambridge.

Warfare

Little definite is known of warfare in the Solomons before European contact, but it appears that hostilities were of three main types—minor inter-clan skirmishes, traditional feuds between villages or districts, and promiscuous raiding by one group against all and sundry. In the last category was the head-hunting raid. The expedition was frequently disguised as a friendly visit to a neighbouring village during the course of which the 'visitors' would fall upon their



Fig. 208. Canoe figure-head from New Georgia

This figure-head, representing a local deity, is carved in soft wood and painted black. Bands of pearl-shell inlay cross the face. The local custom of piercing and distending the ear-lobe is clearly shown. The tenon for attachment to the canoe projects behind the ear. Based on E. Paravicini, *Reisen in den britischen Salomonen*, plate 81 (Frauenfeld and Leipzig, 1931).

unsuspecting hosts. The acquisition of heads was a sign of prowess of the victor and his group; often it was a necessary stage in the initiation of a youth into manhood. Further, the *mana* (supernatural power) possessed by the victim passed to the victor. Some victims were kept alive as slaves to be killed when ceremonial demanded it, as in the launching of a new canoe. Cannibalism was an adjunct of warfare in some areas, particularly among the bush folk of Malaita, San Cristobal and Guadalcanal. The acquisition of *mana*, rather than any craving for human flesh, was the motive.

The weapons formerly used were mainly clubs, spears and bows and arrows. Casualties were then seldom excessive, but the introduction of muskets and Snider rifles led to a great increase in victims.

Except perhaps in the interior of Bougainville, native warfare of any type is now unknown.

Religion

The essential feature of the ancient religion of the Solomon islanders is the cult of ancestors. Everywhere the spirits of the dead are held to be in close touch with the living and able to assist them in return for elaborate sacrifices and ceremonial. These rites demand the services of a specialist in the techniques of approach to the spirits. In some cases the local chief or leader officiates, but generally hereditary priests perform them. The sacrifices of pigs and other food are accompanied by feasts and music and dancing. As noted above, such feasts are not only ceremonies with a strictly religious function; they are also, in many areas, stages in the struggle for political power. Not only is the help of the ancestors thus actively sought, but failure to perform the due rites and lapses from the moral code on the part of their descendants are held to incur their active displeasure. Hence almost every act is hedged about with taboos.

A further belief which is widely held is that the disembodied spirits of ancestors often dwell for a time in various living creatures, particularly sharks and crocodiles. As a result, clans are often totemic in character, in that each believes a particular species of animal to be linked with its ancestor. Clans possessing the same name and totem are found in several of the main islands. Some, such as a snake spirit worshipped widely in San Cristobal, are held to be supreme beings, or creator gods.

Now that missions have been active in the Solomons for seventy years, at least 50 per cent. of the natives have become nominally Christian. But many heathen still exist in the interior of Malaita and Bougainville and some in Guadalcanal and San Cristobal. Ysabel and Choiseul are under full mission influence. Churches and schools have been built. The old religion has been thoroughly discredited by the new; the ancestors have been stripped of their power to intervene and other spirits represented as devils. But the concept of *mana* or spiritual power has been incorporated in the new religion as the power of the Holy Spirit. A lively belief in the retributive side of Christian teaching has replaced the ancient taboos.

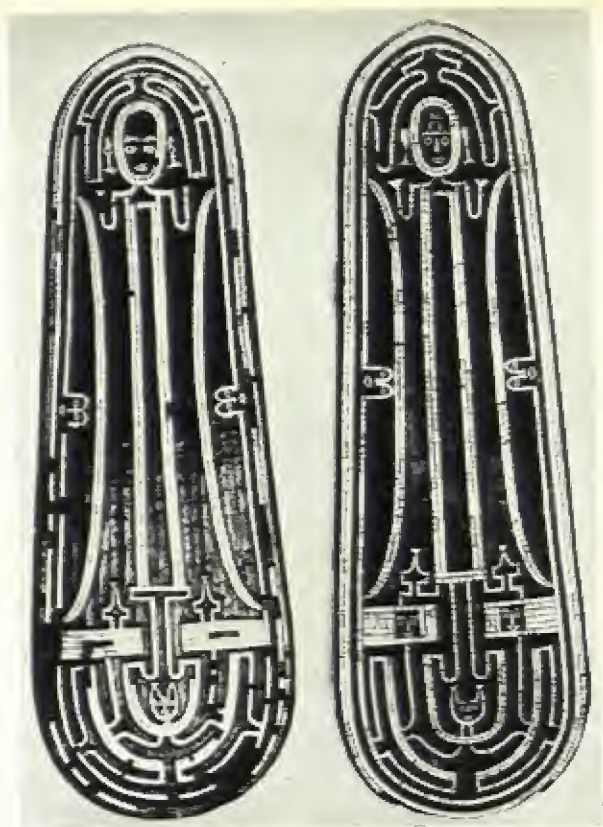


Plate 109. Ceremonial shields

These shields are made of wickerwork covered on the front with a resinous substance in which are set numerous small pieces of pearl shell to form a stylized human figure design. They are of a type formerly made in the south-east Solomons. Length, 2 ft. 10½ in., 2 ft. 11½ in.

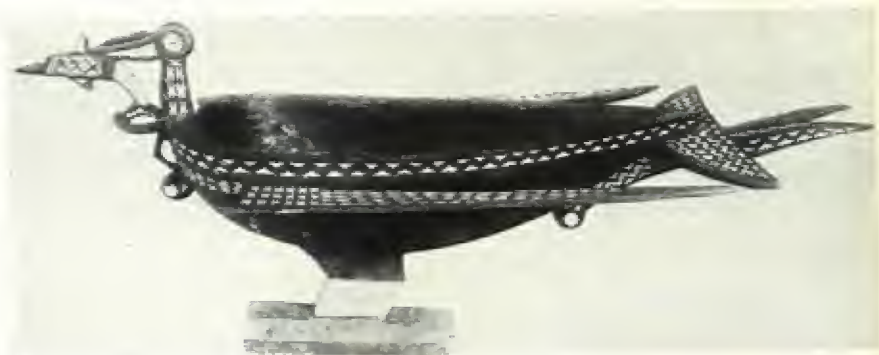


Plate 110. Wooden food bowl, Solomon islands

This bowl shaped in the form of a bird with a dolphin at its beak is carved out of a soft wood and blackened to provide a dark setting for the pearl-shell inlay. Length, 37 in.



Plate 111. Tulagi: waterfront

This is the square wharf shown as No. 4 on Fig. 213.



Plate 112. Tulagi: Chinatown

This part of Tulagi consists of a scattered group of wooden stores and hotels kept largely by Chinese. Numerous small jetties line the shore. Makambo island lies in the mid-distance with the main island of Florida beyond. Photograph taken before the Japanese invasion.

Modern Changes

Some of the modern changes in the life of the Solomon islanders have already been indicated; they affect all aspects of their lives. Economic power has passed from the hands of the middle-aged and therefore wealthiest men to the young men returned from the plantations with their pay in cash and trade goods. The necessity for young men to follow the wishes of their elders in the matter of marriage, when the necessary bride-price could only be obtained with their support, has now disappeared. With this loss of economic power has gone a weakening of political and social control by the elders. Where Christianity flourishes the old taboos regulating conduct have gone; and, however binding in theory, the Christian moral code allows considerable evasion in practice.

The assumption by the British government of all judicial powers has meant the evaluation of criminal behaviour according to a different scale. Frequently offenders who in the old days would have been summarily executed are given light sentences by the administration. Thus, in Malaita, adulterers, who were formerly put to death, now merely serve a term of imprisonment; the result has been greater laxity in sexual standards. In the Reef islands, on the other hand, where compensation for adultery is paid in shell strings, a term in prison is felt to be a hardship.

As elsewhere, diet has suffered from contact with Europeans. The small quantities of cash circulating in native communities are often spent on imported foods—rice, canned meat and fish—to the neglect of more nutritious local foods. Other trade goods have had a deleterious effect on local craftwork. The falling-off in canoe manufacture has already been noted. The destruction of the old religion has ended the carving of cult objects, though the missionaries are attempting to revive the old standards of carving and shell inlay in the construction of church fittings and ornaments, some of which are examples of most intricate workmanship.

ADMINISTRATION

The administrative structure of the British Solomon Islands Protectorate (which includes all but the northernmost islands of the group) and that of the Kieta District of the Territory of New Guinea (embracing Bougainville and islands northward) in many ways resemble one another. Both form parts of larger units. Executive

authority in respect of the protectorate is vested in the High Commissioner for the Western Pacific (p. 171) at Suva, Fiji; and in respect of the Kieta District in the Administrator of the Mandated Territory of New Guinea (vol. IV) at Rabaul, New Britain. Both administrations are in an early stage of development. The maintenance of law and order is still their most important function, and social services are little developed. The protectorate, however, owing to its larger extent, the greater difficulty of the High Commissioner in maintaining contact with the islands, and the longer period during which British administration has been in existence, has increasingly developed a character of its own and attained a growing measure of autonomy. Though in some ways its government retains the characteristics of a 'district administration'—as these exist in British Crown Colonies or in the neighbouring Territory of New Guinea—yet in others it has greater similarity to the central government of a separate colony.

The administration of the protectorate is therefore explained in detail in the following pages, while that of the Kieta District is only briefly noted. The latter is covered more fully in the general account of administration in the Territory of New Guinea in vol. IV of this Handbook.

BRITISH SOLOMON ISLANDS PROTECTORATE

Central Administration

The High Commissioner is represented in the group by a Resident Commissioner, with headquarters at Tulagi. There is neither an Executive nor a Legislative Council, but since 1921 there has been an Advisory Council. In recent years this has been composed of three senior officials and four non-officials, the latter representing missionary and commercial interests in the islands. Under the Resident Commissioner the principal administrative officers are the Secretary to the Government, the Chief Magistrate and Legal Adviser, and the Treasurer. The departmental structure is extremely simple, and the number of responsible officers at Tulagi is quite small.

District Administration (Fig. 209)

For purposes of general administration the protectorate is divided into eight districts, each of which is in charge of a European District Officer. Communication, even within districts which are confined to one island, is still largely by sea. The government attempts to provide

each District Officer with a motor-launch, and, in practice, all but one or two are usually so supplied. By this means nearly all coastal areas with any considerable population are visited about twice during the course of a year. The islands of Ontong Java, Sikaiana, Rennell and Bellona are excluded from this district organization owing to their isolation and to the wide cultural differences between their Polynesian inhabitants and the people of the major islands to which they are nearest. They are governed from Tulagi and, when possible, visited about twice a year.

The districts are in turn divided into sub-districts (or 'headman



Fig. 209. British Solomon Islands Protectorate: administrative districts

District boundaries, shown by a pecked line, are slightly generalized. The District of Santa Cruz, embracing the easternmost islands of the Solomons, is not shown. The spelling San Cristoval has been adopted here, as this is the form used by the administration; the island name has been spelt San Cristobal in this Handbook. District headquarters are marked by a lozenge symbol; headquarters of the Guadalcanal District are at Aola. Based on official sources.

areas'), varying in number from about 30 (in the populous District of Malaita) to 4 or 5 (in Ysabel and Nggela). Each sub-district is placed under a native headman appointed by the District Officer. These appointments are made after consultation with the people. In areas where there is a well-developed system of chieftainship men of hereditary rank are usually appointed, but other factors affecting prestige—such as wealth, education or personality—are also taken into account. Men who have gained some acquaintance with European administrative methods by service in the constabulary are usually appointed. They are made responsible for the cleanliness of the villages and the maintenance of roads and tracks, and, in the more

advanced areas, they collect native taxes. They are paid small salaries, generally ranging from about £3 to £12 a year according to the extent of their responsibilities.

At the lowest administrative level are the village chiefs or headmen. They are 'recognized', and not 'appointed', by the government, being the *de facto* leaders (usually as heads of family groups) of the village communities. They take charge of the work which the headman of the sub-district directs to be done and, during the visits of governmental officials, are treated as authorized spokesmen for their villages.

Law, Justice and Police

The law of the British Solomon Islands Protectorate consists of the common law, rules of equity and statutes of general application in force in England, supplemented by a body of local law. Under the Pacific Order in Council of 1893 the High Commissioner was given power to issue regulations—now known as King's Regulations—on a wide range of subjects. These include the recruiting and employment of native labour, the sale of firearms and intoxicants, and the raising of revenue. The Advisory Council and the system of native administration in the protectorate were similarly inaugurated under King's Regulations. In addition, native custom on matters such as land tenure, succession, marriage and divorce, has often been recognized by the administration where natives are concerned, though in the earlier years of government little attempt was made to study this body of custom systematically.

Civil and criminal jurisdiction within the protectorate are vested in the High Commissioner's Court, which has powers similar to those of the superior Courts of England. The full jurisdiction is exercisable, however, only when the court is presided over by a Judicial Commissioner for the Western Pacific—an office held *ex officio* by the Chief Justice of Fiji and any other judges of the Fiji Supreme Court, and, through appointment of the High Commissioner, by the Chief Magistrate and Legal Adviser of the protectorate. When presided over by a Deputy Commissioner—an office held by all District Officers—the powers of the court are subject to various limitations. In civil matters appeal lies to the Supreme Court of Fiji (which also possesses, though it seldom exercises, an original jurisdiction). There is no formal provision for appeal in criminal matters, but powers of remission and commutation are vested in the High Commissioner.

Recently native courts have been inaugurated to deal with minor offences where only natives are concerned. They operate within the boundaries of the native administration sub-districts. Each court is composed of the native headman and a panel of elders—numbering probably from twenty to thirty, of whom only a few may sit on any single occasion.

Police duties are performed by an armed native constabulary, which also serves as a defence force. It is officered by a Superintendent and a Sub-Inspector, both Europeans; and there are two native non-commissioned officers and 112 constables. Detachments are stationed in all district headquarters. There is a central prison at Tulagi and there are small prisons at the various district headquarters.

Land Policy

The protection of native rights to land has from the beginning been one of the primary aims of the administration. In earlier times Europeans acquired the freehold of large vaguely defined areas in the islands. In 1913, however, a survey department was established, and in the following year a standardized system of leases was introduced. Native ownership of all land not alienated before the introduction of the regulations has been recognized. Leases can be obtained by Europeans only with official sanction. Where cultivation is intended they are usually for 99 years, with the possibility of renewal at the end of that period.

Labour Policy

The years from 1896 to 1910—when the protectorate administration was being established—saw the cessation of the labour flow to overseas territories and the beginning of a large-scale demand for labour on local plantations. For some years recruiting was carried on without much change, though the existence of a government in the islands prevented many of the most undesirable practices. In 1921, however, a comprehensive labour code was introduced. Subject to a number of amendments, this still operates.

The recruiter is required to take out a licence. He is forbidden to give 'beach pay'—i.e., the payment of compensation to the relatives of a recruit—or to engage in trade at the same time as he is recruiting. Employers are required to pay £10 to the recruiter and the same amount to the government for each labourer taken on. The standard term of indenture is fixed at two years, with provision for extension for further periods of one year; wages, hours of work and standards

of housing and rations are similarly laid down (p. 660). Women may only be employed on a day-to-day basis and within 10 miles of their homes, except as domestic servants under contract to a European woman.

As in many other parts of the Pacific, natives are loath to work for wages if they can obtain a satisfactory income from the cultivation of their own lands. It is thus from the poorer and most thickly populated islands, especially Malaita and Guadalcanal, that the majority of recruits are obtained.

Finance

The revenue of the protectorate has always been very small. It rose between 1921-2 and 1928-9 from £56,433 to £79,935; but in the following years it again greatly diminished, reaching its lowest point of £52,927 in 1934-5. After that the increase in copra prices caused it to rise again to £82,809 by 1937-8. Between a third and a half of the total is usually obtained from import duties. The next most important sources are export duties and native tax. The latter is levied on males between the apparent ages of 16 and 60 and varies from island to island according to ability to pay. In 1933 it was fixed at £1 a head for Nggela, Savo, Ysabel, the Russell islands, Gizo and the Shortlands; at 10s. for Guadalcanal; and at 5s. for Malaita. District Officers are allowed to exempt individuals or whole communities from payment where undue hardship would be caused.

Since the growth of revenue has been so slow and the prospect of any large future increase quite uncertain, it has not been considered wise to borrow. Expenditure has normally been kept slightly below revenue. In these circumstances it has been impossible to embark upon any extensive programme of public works or to develop social services beyond the barest minimum. In recent years, however, the situation has been slightly improved by small grants from the Colonial Development Fund. In 1937-8 the largest heads of expenditure were: public works, £11,927; medical services, £10,350; and legal and district administration, £8,784.

KIETA DISTRICT (MANDATED TERRITORY OF NEW GUINEA)

The northern Solomon islands form one of the seven districts into which the Territory of New Guinea is divided. The headquarters of the district are at Kieta, from which place it takes its name. The chief administrative official in the Kieta District is the District Officer.

He is immediately subordinate to the Director of the Department of District Services and Native Affairs at Rabaul. The latter, in turn, is subordinate to the Administrator, who is appointed by the Australian Commonwealth Government. From Australia reports are made annually on the work of the administration to the Mandates Commission of the League of Nations.

* As in the protectorate, the duties of the district administrative staff are extremely wide. They include: (i) visiting all villages under government control at least once a year for tax collection and census purposes; (ii) peaceful penetration of the large areas in the interior and on the west of Bougainville which are still only 'under partial government influence'; (iii) supervision of the recruiting and employment of native labour; and (iv) judicial duties. To assist him the District Officer has an Assistant District Officer (stationed on Sohana island, in Buka passage), several Patrol Officers and one or more Cadets. Police work is carried out by native constabulary. Native authorities of several grades—ranging from 'paramount chiefs' of native districts to various village officials—are appointed by the government.

The lowest judicial tribunals are the Courts for Native Affairs, held by the District Officer, the Assistant District Officer or a Patrol Officer in the villages or at a government station. Above them is the District Court, which is presided over by the District Officer or the Assistant District Officer. The highest Court in the territory is the Supreme Court at Rabaul.

SOCIAL SERVICES

MEDICAL SERVICES

Owing to deficiencies of diet, the abandonment of old-established ways of life and the introduction by Europeans of new diseases, the health of the Solomon islanders is poor. A survey carried out in the main islands of the protectorate in 1938 showed that from 60 to 90 per cent. of the people in different areas suffered from malaria and from 40 to 70 per cent. from yaws. The incidence of skin diseases and of dysentery is also extremely high. Epidemics of measles and influenza have at times caused large numbers of deaths. On the basis of the 1938 survey, it was estimated that there were about 1,000 persons suffering from leprosy in the protectorate islands; the disease is also found in Bougainville. The incidence is highest in Malaita, where it is believed there are about 600 lepers. A very high

proportion of these are among the 'bush' people, living inland and until recently having only occasional contacts with the people of the coasts. It is therefore believed that the disease has been long established in the islands.

Disease has been the major factor in depopulation (p. 630). But the cost of providing completely adequate medical services in an area such as the Solomons is far beyond the means of the local authorities. The protectorate has, for example, not been able to afford to send lepers to the leper hospital at Makongai, in Fiji (p. 188); and in both administrative divisions of the Solomons lepers have commonly had to be treated in the hospitals in dangerous proximity to other patients.

Before the Japanese invasion the protectorate government maintained a hospital for Europeans, Asiatics and natives at Tulagi, under the control of the Senior Medical Officer, and a smaller hospital at Auki. At several other government stations there were hospitals for natives only, under native medical practitioners. A second European medical officer, also with headquarters at Tulagi, spent much of his time visiting the village communities throughout the protectorate, for which purpose he was provided with his own vessel. Native medical officers also travelled widely, often accompanying District Officers on their patrols and sometimes remaining in remote districts until another patrol provided them with the opportunity for moving on. In the Kieta District, the New Guinea administration maintained a hospital at Kieta under a European medical officer, and another at Buka passage under a medical assistant. In the more populous parts of Buka and Bougainville, and in several of the atolls, trained native medical orderlies were stationed; and in most villages there were 'medical *tultul*' (men who had received some training in first aid and were charged with certain simple duties in regard to public health and sanitation). In both the protectorate and the mandated territory campaigns have been carried out in recent years against hookworm and yaws with the assistance of the Rockefeller Foundation.

In addition to the governments, missions and several commercial firms undertook medical work. The Melanesian Mission maintained a hospital at Fauabu, on Malaita, under the charge of a European medical practitioner, and another on Ugi; the Methodist mission had a hospital at Bilua, on Vella Lavella, under a European doctor, and another at Mbambatana, on Choiseul; the Seventh Day Adventist mission had a hospital on Kolombangara; and there were three

hospitals controlled by the Roman Catholic mission. Several of these received official subsidies.

EDUCATION

In both the protectorate and the mandated islands education is entirely in the hands of the missions. Village schools exist in great number, but the standard is generally rather low. The teachers, who have usually received only a minimum training, combine their work in the schools with the normal agricultural and other activities of the village. The medium of instruction is generally the vernacular or, in Melanesian Mission schools, the Banks islands language Mota. Books available in the vernacular languages are few—usually only a portion of the Bible and one or more religious manuals. The teaching of English to older children has become more common in recent years; but its advance must remain rather slow owing to the lack of competent teachers. On the practical side the work of the village schools has often reached a higher standard. Much emphasis has been placed on the teaching of simple crafts and improved methods of gardening.

Several missions have founded boarding schools in order to bring their pupils under more effective control. The highest schools in the islands are the teacher training colleges of the various missions, which are also boarding schools and have a proportion of European teachers. In the protectorate, the administration has begun to take a more active interest in education—primarily to increase the trained men who can be appointed to responsible posts, such as those of sub-district headmen—but so far only preliminary action has been taken. From the protectorate a number of men have been sent to the Central Medical School at Suva, Fiji (p. 188), for training as native medical practitioners.

MISSIONS

Between two-thirds and three-quarters of the people of the Solomons are professing Christians. Before the Japanese invasion five missionary bodies were working in the group. (Details below all refer to the period prior to 1941.) The mission with the largest number of adherents was that of the Roman Catholic order of Marists, which was organized in two divisions. The Vicariate Apostolic of the Northern Solomons, with headquarters at Kieta, covered all the mandated islands and the northern part of the pro-

tectorate—as far south as Choiseul and Vella Lavella. The Vicariate Apostolic of the Southern Solomons included the remainder of the group and had its headquarters at Visale, in Guadalcanal. The two divisions together supported about 36 stations with European staff and between 600 and 700 churches and chapels, the majority under the charge of native teachers. They had 40,000 adherents, of whom approximately 70 per cent. were in the mandated islands.

The next largest missionary body is the Melanesian Mission of the Church of England, which confines its activities in the Solomons to the islands of the protectorate. Ever since the foundation of the mission over ninety years ago (p. 624) it has been one of the primary agents in the spreading of European ideas in the islands. Its head, the Bishop of Melanesia, is a secular, as well as an ecclesiastical, figure of importance in the protectorate; its hospitals have long formed an essential part of the islands' medical services; its printing press—at one time on Norfolk island (p. 400) but since 1920 at Hautambu, on Guadalcanal—has been the principal source of books in the vernacular languages; and its successive mission ships—each bearing the name *Southern Cross*—have been the most frequent callers on the coasts of scores of islands. The mission's headquarters were for many years at Siota, on the east coast of Nggela, but recently a move was made to Taroaniara (Fig. 221), on the opposite side of the island. The mission maintained from ten to twelve stations with European staff, some stations with native priests, and about 400 churches. It had 29,000 adherents.

Like the Marist mission, that of the Methodist Missionary Society of New Zealand spreads over both administrative divisions of the group; but its activities are restricted to the western islands. Local headquarters are at Kokenggolo, on the Roviana lagoon, in New Georgia. It had other European stations on Vella Lavella and Choiseul, at Kieta, and on small islands off the coast of Bougainville. It possessed about 230 churches and 16,000 adherents.

The fourth missionary body, in point of size, was the South Seas Evangelical Mission, with from 250 to 300 churches and 13,000 adherents. This is an undenominational body, supported mainly by Baptists and with headquarters in Australia. It was originally formed in response to a demand from men who had been converted to Christianity while working on plantations in Queensland; and its principal field of work is still the island of Malaita, from which the greatest number of plantation labourers was recruited. Its local headquarters are at One Pusu, on the west coast of Malaita.

The Seventh Day Adventists also maintained a mission in the Solomons. Their principal station was at Batuna, on the Marovo lagoon, in New Georgia, where special stress was laid on the teaching of various trades—such as carpentry, boat-building, and simple engineering—to its native teachers and adherents. Most of the work of the mission was carried out in the western Solomons; there were several European stations in the New Georgia group, one in Choiseul, and one in Bougainville. But some work was also done in Malaita. The total number of adherents was about 4,000.

ECONOMICS

The economic resources of the Solomons have been only slightly developed and are still very imperfectly known. The islands first became of economic importance as a source of labour for the plantations of Queensland and Fiji. As a field for tropical agriculture, they did not attract attention until the beginning of the present century, when individual settlers and large firms began to take up land for coconut plantations. To avoid too great dependence on a single crop, subsidiary crops were tried, but the quantities grown were never large and for the last thirty years have been negligible. The native population live mainly by subsistence agriculture and fishing. Nevertheless, they produce small quantities of copra and the bulk of the minor exports—ivory nuts, trochus shell and green snail shell. Timber production by a European firm on Vanikoro has developed since 1925.

MINERAL RESOURCES

Since the main islands of the group are of volcanic origin, their igneous rocks are likely to contain minerals of economic value. Gold is known to occur on Bougainville, New Georgia, Vangunu and Guadalcanal. Tin has been reported in south Bougainville. But inadequacies of survey and the difficulties of prospecting have meant that only gold has been exploited, so far still in small quantity.

By 1935-6 a small goldfield had been developed at Kupei, inland from Kieta in Bougainville (Fig. 215). In that year 136 oz. were produced. In the following year a crushing plant was installed and production rose to 720 oz. Since then, owing to difficulties with machinery and shortage of labour, production has fallen off, the 1939-40 figure being 297 oz. On Guadalcanal a mining area has been

proclaimed on the upper reaches of the Sorvohio and Tsarivonga rivers. In 1937 the Guadalcanal Sluicing and Dredging Company, Ltd., with a capital of £200,000, began work. In 1940 several hundred ounces of alluvial gold were produced; in 1941 the figure rose to nearly a thousand ounces.

The presence of commercially paying phosphate deposits has been suspected on Rennell, but a survey carried out in 1927 showed that their quality was poor.

Copra

AGRICULTURE

The production of copra has been the most important industry of the Solomon islands for over fifty years. At first nearly all was the produce of native groves; but about 1900, Europeans began to take up land for the establishment of plantations. Within a relatively few years plantation-produced copra assumed a predominant importance. Exports rose steadily till about 1928 (Fig. 210). From that time on the annual export remained at about 20,000 tons until 1940. Increases in output have been checked mainly by the low prices prevailing during trade depression. The small export in 1940 was due partly to this factor and partly to shortage of shipping. In that year, despite the London price of £13 10s. per ton, planters were receiving only about £3 per ton on the beaches. Production costs were then estimated to average £6 per ton. Estimates of the labour force needed vary from one man for every 10 acres to one man for every 20 acres.

Insect pests have in recent years presented a very serious menace to the industry, especially by causing the young nuts to fall before reaching maturity. It has recently been established that nut-fall is due to the activities of a bug, *Amblypelta cocophaga*. Other damage to the young nuts is caused by the coconut spathe moth (*Tirathaba rufivena*), and the beetle *Brontispa froggati* damages the unopened leaves of the palm. *Amblypelta* appears always to have been present in the jungle on some islands but to have transferred its attention in recent years to coconut palms. Attempts have been made at biological control of the pest, but so far without any success. The chief areas so far affected by premature nut-fall are Guadalcanal, Malaita and Nggela. Every effort is made to prevent it spreading to hitherto-unaffected areas. The seriousness of the menace can be seen by contrasting the average yield of 15 cwt. of copra per acre in the unaffected Russell islands with that of 2 cwt. per acre in the affected islands.

Not all the copra export of the Solomons is the produce of Euro-

pean plantations. Natives have to some extent met their needs for cash by preparing small quantities from their own coconut groves for sale to European and Chinese dealers. Native copra is smoke-dried and of very poor quality. The government has recently attempted to improve the standard by encouraging the building of an improved type of copra kiln. Native production tends to be influenced more than that of the large plantations by fluctuations in prices. The large firms have sufficient capital to tide them over

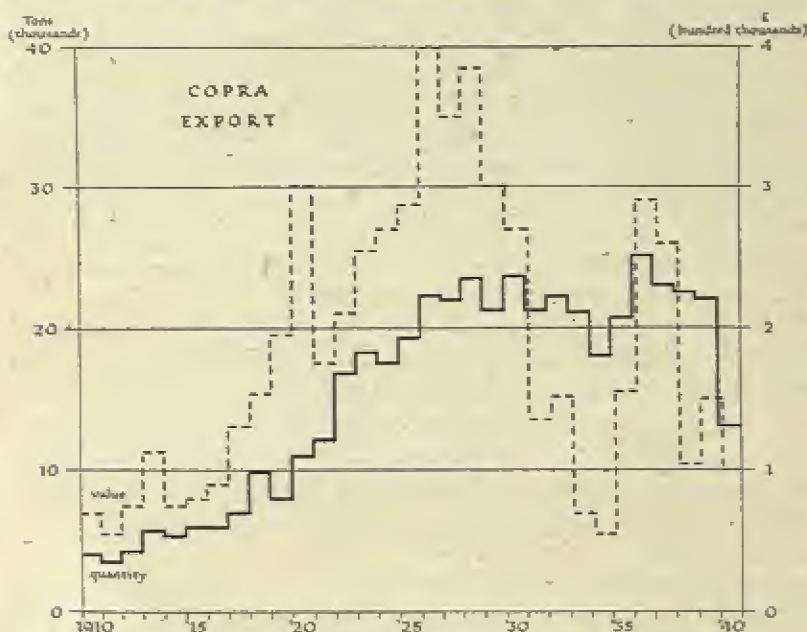


Fig. 210. Export of copra, British Solomon Islands Protectorate

Based on *British Solomon Islands Protectorate Blue Book* for 1910-40 (Suva, 1911-41).

such a slump period. To natives, however, copra production is only one of several ways of obtaining cash, and when prices are very low they turn their attention to other sources of income. Thus in 1932 they produced about 3,000 tons, while a year later when prices had fallen by half they produced only 300 tons.

Minor Crops

The large copra producers made several attempts early in the present century to introduce secondary crops to the Solomons,

partly on areas specially devoted to them and partly as inter-crops on coconut plantations. Small areas of Para rubber were planted on Guadalcanal, Ysabel, Rendova and Vella Lavella, but with the low prices ruling since about 1925 tapping has been neglected. About 112 tons of rubber per annum has been estimated as the largest quantity obtainable without over-tapping the trees.

Bananas were exported to Sydney in the first decade of the century and commanded high prices, but this export has since been killed by competition with Fiji fruit and still more by the Australian protective tariff. The Malayta Company has tried inter-cropping cocoa on its coconut plantations. West African oil palms have been grown experimentally by Lever's Pacific Plantations in the Russell islands; but to become a paying crop large quantities would have to be grown and a mill for extracting the oil set up locally. Kapok and the tung oil plant (*Aleurites Fordii*) have recently been planted in a small way; the results have not been successful. Ground nuts, grown experimentally by Lever's, have been a success but the export is hampered by the high Australian tariff.

Ivory nuts are an export of some importance in the protectorate. In 1938, 534 tons, valued at £3,602, were exported. The nuts are the fruit of a species of sago palm (*Metroxylon solomonense*) which grows wild and are collected by natives for sale to local dealers. They contain a hard albuminous substance resembling ivory and are used in the manufacture of buttons and similar small objects. Recently an attempt has been made to plant swamp land with the palm.

Animal Husbandry

Animal husbandry is but slightly developed in the Solomons. Considerable numbers of cattle are kept on the coconut plantations, partly for food but mainly to keep down the grass and weeds. Smaller numbers of goats and pigs are also kept for meat. Horses and mules are used for draft and pack purposes. The numbers of head kept by Europeans in the protectorate in 1939 were as follows:

Cattle	16,015
Goats	544
Pigs	480
Horses	235
Mules	235

Based on *British Solomon Islands Protectorate Blue Book for 1939*, p. 102 (Suva, 1940).

The natives everywhere keep pigs as a source of meat for ceremonial feasts.

FORESTRY

The rain forest of the main islands contains many species of trees which elsewhere in the Pacific are exploited commercially. But uninterrupted areas of virgin forest are not common; the shifting cultivation of the natives has replaced much of this by secondary growth. Lack of communications and the absence of pure stands of individual species have prevented the development of forestry. The one exception is a species of pine allied to the kauri of New Zealand which grows abundantly on Vanikoro in the Santa Cruz

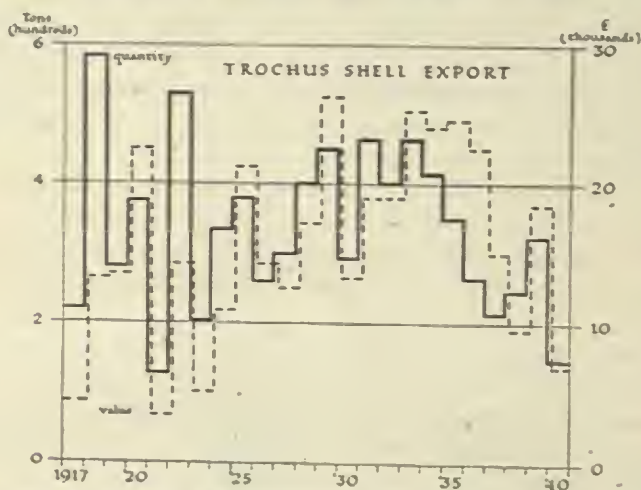


Fig. 211. Export of trochus shell, British Solomon Islands Protectorate
Based on (1) *Handbook of the British Solomon Islands Protectorate* (2nd edition, Suva, 1923); (2) *British Solomon Islands Protectorate Blue Book for 1921-40* (Suva, 1922-41).

group; one estimate places the quantity at over a hundred million superficial feet. A mill was erected by the Vanikoro Kauri Timber Company, Pty., Ltd., in 1925, and the annual production by 1940 had reached the figure of 2,021,745 superficial ft. The neighbouring island of Tevai, also rich in kauri, has been declared a government reserve.

FISHERIES

Although the seas of the group abound in many kinds of edible fish, there is hardly any organized fishery beyond that carried on by the coastal natives. Marine products entering into overseas commerce include trochus and green snail shells, for which the

natives dive on the reefs; they are used in the pearl-button industry. Fig. 211 gives the quantity and value of trochus exports for the period 1917-40. The green snail export is much smaller, being valued in 1938 at only £1,800 compared with £14,945 for trochus. Japanese have fished the reefs for *bêche-de-mer*, some of them legitimately, under contract to a local trading firm, others as poachers.

LABOUR

The administrative and technical posts on plantations tend to be filled by Australians, owing to the close commercial contacts between the Solomons and Australia. A few Chinese are employed as mechanics and tradesmen by the administration and on plantations. The bulk of the unskilled labour force is recruited from the native population. In the protectorate in 1938, 5,303 natives were working on plantations, 323 were in domestic service, and 270 were employed by the government. Native labourers are indentured for periods up to two years, but contracts are frequently renewed for further periods. Plantation labour in the mandated islands is drawn from a much wider area, including the Bismarck archipelago and New Guinea; a total of 2,897 men were employed in 1939.

Wages are paid partly in cash and partly in kind. In recent years they have been fixed at 10s. a month for youths employed on light work and at 20s. for men. In 1934 these wages were temporarily reduced by half owing to the very low copra prices then prevailing. In 1938 wage rates for Chinese averaged £10 to £11 per month, and those for Europeans in agriculture £25 per month. Natives and Chinese work on an average a 50-hour week.

TRADE

Overseas trade in the Solomons presents a relatively simple picture. Since copra is the only export of consequence, the general prosperity of the country is dependent on conditions in the world copra market. The small number of Europeans in the islands restricts the demand for the more costly imported goods, and the poverty of the native population has precluded the import of all but the cheaper type of goods for the native trade.

Annual exports over the period 1919-37 have varied between £112,000 (in 1933) and £452,000 (in 1926). After copra (Fig. 210) the only large item by value is trochus shell (Fig. 211). Third in importance is timber, most of which is kauri from Vanikoro. In

1940-41 the export of timber considerably exceeded that of trochus shell and was valued at almost £12,000. Ivory nuts are generally fourth in importance, though the export has tended to decline in recent years. In 1929-30, 840 tons, valued at over £8,000, were exported; six years later the quantity had fallen to 593 tons, valued at just over £4,000. Other items—including green snail shell, turtle shell and *bêche-de-mer*—are very small.

A high proportion of the goods exported are shipped initially to Australia (Fig. 212). Some are re-exported thence, so that statistics of exports do not give a true picture of final destinations. According

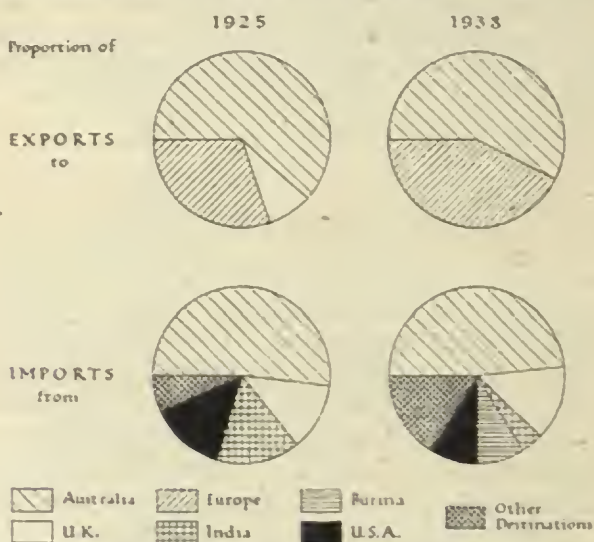


Fig. 212. External trade, British Solomon Islands Protectorate

Based on *British Solomon Islands Protectorate Blue Book* for 1925 and 1938 (Suva, 1926, 1939).

to the official figures, more than half of the copra and the bulk of the trochus and green snail shell go to Australia. The remaining copra is sent to the United Kingdom and other European countries.

The annual imports over the period 1919-37 have been nearly always well below the value of exports. They have varied between £150,000 (in 1935) and £325,000 (in 1921). Australia provides the bulk (Fig. 212). The plantation economy determines closely the nature of these items. Rice is imported from India and Burma; copra bags from India; machinery, largely agricultural, from Australia, the United Kingdom and the United States; and textiles

from the United Kingdom. Much of the preserved meat comes from Australia and New Zealand. Petroleum products come mostly from the Netherlands East Indies and the United States. Tobacco, in considerable quantities, comes from the United States and Australia.

Internal trade within the group is mostly in the hands of a few large concerns, some of which combine plantation-owning with shipping and general trading: Burns, Philp (South Sea) Company, Ltd., and W. R. Carpenter and Company, Ltd., are two of the largest. Besides warehouses at such centres as Tulagi and Gizo the companies maintain stores on many plantations and even in native villages where copra is produced on a small scale. Competing with these firms are a small number of Chinese traders, centred mainly in Tulagi. The local stores act as centres for the sale of 'trade' goods to the labourers and local inhabitants and serve also as collecting points for copra bought from native producers.

PORTS AND SETTLEMENTS

There are no well-equipped ports in the Solomons; and the principal settlements are all very small. Buildings, wharves and other facilities which existed before the Japanese invasion have since been much damaged and, in many cases, completely destroyed. The ports of entry are Tulagi, Faïsi (Shortland harbour) and Peu, in the protectorate; and Kieta, in the Australian mandated islands. At Faïsi, Peu and Kieta there were no wharves; but limited wharfage accommodation was available at Tulagi, Makambo and Gavutu, and also at Gizo (in the New Georgia group) and Yandina (in the Russell islands).

TULAGI (Plates III, II2)

Tulagi, the administrative centre and chief port of the protectorate, is situated on an island of the same name on the south-west side of Nggela island. Tulagi island is $2\frac{1}{2}$ miles long and under $\frac{1}{2}$ mile wide. Tulagi harbour, formed by the water between the island and the mainland, is most conveniently considered in conjunction with Gavutu harbour, behind the island of that name, about 3 miles to the east. The whole area (Fig. 213) forms a bay about 6 miles across, surrounded by steep wooded hills and open to the south save for the protection offered by the islands of Tulagi and Gavutu and by Southern Cross reef. The shore of the mainland is mostly fronted by a fringing reef and mangrove swamps. The bay is divided into three

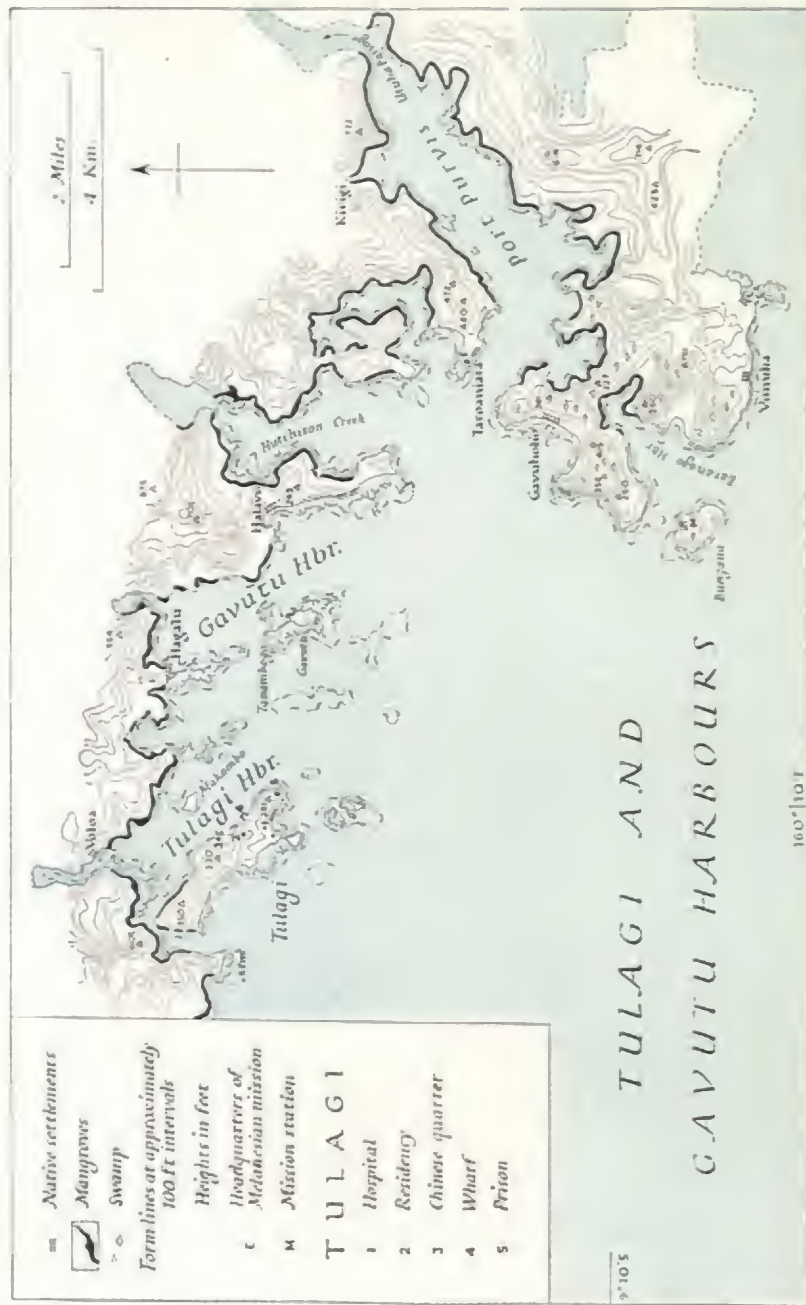


Fig. 213. 'Tulagi and Gavutu harbours

Based on: (1) Admiralty charts nos. 14141, 2658, 2659; (2) other official sources.



sections by a tongue of reef stretching almost to Gavutu, and by a chain of reefs and shoals ending in Woodford reef. Gavutu harbour, the most easterly section, has ample anchorage area in depths varying from 10 to 20 fathoms. The central section is rather exposed. The western section, Tulagi harbour, provides ample accommodation with depths varying from 10 to 27 fathoms. In the centre of the harbour is the small island of Makambo.

Before the Japanese invasion Tulagi island contained many government buildings, including—besides the Residency and public offices and stores—the central hospital and central prison for the protectorate. Other establishments included a hotel, a refrigerating plant, the offices and stores of several commercial firms, and a boat-building yard (capable of building launches up to about 25 tons). Houses, shops and stores of the Chinese inhabitants were clustered along the shore to the south of the boat-building yard; many had wooden landing stages. The government had built a small wooden wharf 74 ft. long, with a depth alongside of 21 ft., against which vessels could lie in most weathers. No water or lighting was laid on; and the only lifting apparatus was a small jib-crane. There were formerly no vehicular roads, but only paved paths, on the island. (Very recently roads have been built.) The population of Tulagi in 1931 comprised 94 Europeans, 428 natives and 197 Asiatics; these figures are believed to have remained more or less unchanged until 1941.

Makambo island is the local headquarters of the Burns, Philp (South Sea) Company. It possessed a wharf 126 ft. long, with minimum depth alongside of 16 ft. There was also a boat-building slip. Gavutu island is the headquarters of Lever's Pacific Plantations. It possessed a wharf on the east side and a small jetty for lighters to the south of it, both protected by a breakwater. About $\frac{1}{4}$ mile to the north of Gavutu and connected with it by a causeway is Tanambogo island, which was used as a golf course.

FAISI (SHORTLAND HARBOUR) (Plate 114)

As an exporting point for copra Faiai is the second port of the protectorate; but facilities have always remained extremely limited. The harbour is off the south-east of Shortland island, to the north of Poperang and Alu. In the harbour are the islands of Orlofe, Onua and—nearer the shore—Faiai. There was a wharf 150 ft. long with 18 ft. of water alongside on the south-western side of Faiai island.

To the west of Faisi is a bay fringed with mangroves with depths of up to 9 fathoms, where small craft can anchor. The main anchorage is to the east of Faisi and the north of Poperang; it is exposed. There is a government station on Shortland island and a Burns, Philp store on Faisi. The European population of the area before the invasion consisted of about 30 men and some of their families.

PEU

Peu, the smallest port of entry in the protectorate, is on the south of Vanikoro island, in the Santa Cruz group (Fig. 226). It is the exporting point of the Vanikoro Kauri Timber Company (p. 659). The government station for the District of Santa Cruz is also situated here. The harbour is approached through Bruat passage or Pallu passage in the barrier reef. The former is unsuited for vessels drawing more than 11 ft., owing to the presence of detached coral heads. The latter is about 3 miles wide, but there are several obstructions. The harbour consists of a small bay at the mouth of the Laurence river. The coast is fringed with coral reef except in the immediate vicinity of the river mouth, where there are short stretches of sand on either side. There is a small jetty. Communication is maintained with Tulagi by W/T.

GIZO

Gizo, though not a port of entry, has been regularly used by ocean-going vessels for the export of copra. Before the Japanese invasion, the government station for the New Georgia group (Fig. 219), a hospital, and a number of stores were situated there. Gizo island is extensively planted with coconut palms.

The harbour is situated in a small bay in the northern side of a spit of land projecting eastwards from the island and protected by Shelter island to the north. The shores of the bay are mostly fringed with coral, but there is a sandy beach near the wharf. The harbour can be approached from the south, through the reef extending eastwards from Gizo, by a passage about 1,000 yd. wide and 10 fathoms deep, but partly obstructed by shoals. There is another (northern) entrance between Gizo and Shelter island; it is about 400 yd. wide.

KIETA

Kieta, on the east coast of Bougainville (Fig. 215), is a port of entry of the Territory of New Guinea. The harbour (Plate 113) lies between



Plate 113. Kieia harbour from the southern entrance
The settlement is situated on the peninsula immediately beyond the warship.



Plate 114. Faisi from the south-east

In the distance is part of Shortland island. The gap in the centre separates Faisi island (on right) from Shortland island (on left). In the foreground is part of Poperang island.



Plate 115. Roviana lagoon, New Georgia

The fringing and barrier reefs appear white; on the latter can be seen a string of low islands—sections of former reef which have been elevated.

Kieta peninsula and Bakawari (Pokpok) island. It is enclosed by steep hills, and additional protection is given across the northern entrance by a barrier reef about 2 miles to the north-east. There are several passages through this reef. There is also a southern entrance to the harbour. Anchorage is in from 15 to 35 fathoms.

The settlement of Kieta is on the western side of the harbour. It is the administrative and commercial centre of the Australian mandated Solomons. There is a government hospital and there are several mission stations in the vicinity. The population before the Japanese invasion comprised about 100 Europeans and 1,500 natives.

COMMUNICATIONS

Sea Communications

The Solomons are not on any major trans-oceanic shipping routes. A regular service between Australian and islands ports is maintained by Burns, Philp and Company, Ltd., under subsidy from the Australian Commonwealth and British Solomon Islands Protectorate governments. The company's vessel leaves Sydney at intervals of $5\frac{1}{2}$ weeks. Calls are made at Brisbane and Townsville. Tulagi is reached in 11 to 12 days. The ship then proceeds through the group and continues to Rabaul, whence she returns to Tulagi before leaving the islands. Until the outbreak of war in 1939 ships of the Nord-deutscher Lloyd Line maintained a service with the islands from Hong Kong, calling *en route* at Madang, Salamaua and Rabaul. Tramp steamers—especially those of Norwegian registry—visit the islands at irregular intervals to load copra.

Inter-island communications are maintained by small steamers and motor vessels owned by the Burns, Philp company, W. R. Carpenter and Company, and Lever's Pacific Plantations. Local traders, labour recruiters and planters maintain cutters and schooners with auxiliary engines; the Melanesian Mission has a motor vessel; and the government has a number of launches.

Land Communications

The tracks which link the main centres of native population are suitable only for foot traffic. In the interior of the major islands they are usually very rough; and, with the drift of the population to the coasts (p. 631), they are deteriorating or becoming completely overgrown.

In the northern Solomons some of the more important tracks were converted by the German authorities into rough roads. A road was made right round the coast of Buka, and a similar stretch was constructed on the east coast of Bougainville, to the southward of Kieta. This work has been continued by the Australian administration (Fig. 215). A rough road (Plate 124), with few bridges over the streams, now follows the north and east coasts of Bougainville; and a complex network exists in the Buin and Siwai districts in the south of the island. Near Kieta considerable bridge building has been undertaken, the largest structure being about 200 ft. long. Everywhere, however, the roads are narrow and the surface is rough. In all parts of the group there are stretches of road, generally surfaced with broken coral, on the coconut plantations. Many of these are used only for bullock carts, but on others motor cars and trucks are operated. As a result of military operations, roads have recently been built on some of the southern islands, as for example on Nggela (Fig. 221).

Signal Communications

Before the Japanese invasion there was a government-operated W/T station at Tulagi, which maintained communication with Australia and neighbouring island groups. At Kieta a station was operated by Amalgamated Wireless under arrangement with the Australian government. In 1937 the protectorate authorities installed wireless-telephone apparatus at Tulagi and Auki. Their aim was gradually to link all government stations by this means. In 1939 they made experiments in short-wave broadcasting from Tulagi. In addition to these official stations there were a number of private stations, of which the most important were at Vanikoro (maintained by the Vanikoro Kauri Timber Company) and at Berande, in Guadalcanal.

(For Bibliographical Note see Chapter XVI.)

Chapter XVI

INDIVIDUAL ISLANDS OF THE SOLOMONS

Northern Atolls: Buka: Bougainville: Shortland Islands and Treasury Islands: Choiseul: New Georgia Group

Ysabel: Russell Islands: Nggela: Malaita: Sikaiana: Guadalcanal: San Cristobal
Rennell and Bellona: Santa Cruz Group and Outlying Islands

Bibliographical Note

The Solomon islands are so scattered that no simple and logical order of treatment is possible. Further, geographical, cultural and political groupings do not always coincide. A somewhat arbitrary sequence has, therefore, been followed. The major islands are described in order from north to south, beginning with Buka and Bougainville and ending with San Cristobal. The smaller islands in the main group are dealt with immediately after the major island with which they are most closely associated. The outlying islands are inserted at the most appropriate places: thus the northern atolls are described first of all, before Buka and Bougainville; Sikaiana is described after Malaita; and Rennell and Bellona are described after San Cristobal.

NORTHERN ATOLLS

The northernmost islands of the Solomons—Nissan, Kilinailau, Tauu, Nukumanu and Ontong Java—are all of atoll formation. With the exception of Kilinailau, all are inhabited by people of predominantly Polynesian origin.

NISSAN

Nissan (Fig. 200) (lat. $4^{\circ} 30' S$, long. $154^{\circ} 13' E$) consists of an atoll about 7 miles long and 5 miles wide, together with the small coral island of Pinepil to the northward. The group has been variously known as Nissan, Sir Charles Hardy's islands, and Green islands. The main island of Nissan forms the north, east and south sides of the atoll rim. On the west side are the two small islands of Sirot and Barahun, each surrounded with reef. A passage 3-4 fathoms deep separates Barahun from the main island. The principal entrance to the lagoon lies between Sirot and the northern end of Nissan island. It is 40-50 yd. wide, with a least depth of 16 ft. The lagoon appears to be free from reefs and has depths of 11 to 15 fathoms. In parts the shores have sandy beaches, while in other parts they are fringed with mangroves. There are coconut plantations at each end of Nissan island. Breadfruit trees and areca palms are also common. In 1940 the population of the group was 1,427.

KILINAILAU ISLANDS

The Kilinailau or Carteret islands (Fig. 200), lying about 40 miles north-east of Buka, were discovered by Captain Carteret in 1767. They consist of six islands on a circular reef of atoll type 8 miles in diameter: Piuli, Yehamu, Yovo and Irinalan, on the eastern side of the reef; Sila (lat. $4^{\circ} 39' S$, long. $155^{\circ} 19' E$), about 60 ft. high, and Jangan, which has a trading station, on the west. The sea at times breaks heavily on the eastern side of the reef; two passages through its southern side, one with a depth of 4 fathoms, give access to the lagoon. The population (numbering 446 in 1940) comprises the descendants of refugees who fled many years ago from Buka. All the islands are planted with coconut palms.

TAUU

The Tauu or Mortlock islands (Fig. 200), lying about 90 miles to the east of the Kilinailau islands, were discovered in 1616 by Le Maire and Schouten and named by them the Marqucen islands. They consist of 23 low coral islets on an atoll reef; most are grouped on the eastern side of the lagoon. Taku, the southernmost, is the largest. The entrance through the southern side of the reef into the lagoon can be used by vessels of about 600 tons with local knowledge. To the south of Nugurigia islet is a smaller passage suitable for schooners. The population consisted in 1940 of 178 Polynesians.

NUKUMANU

Nukumanu (Fig. 200) lies about 170 miles eastward of Tauu. It was discovered by Tasman in 1643. It is an atoll about $11\frac{1}{2}$ miles in diameter from east to west, with about 40 palm-covered islets. The largest of these, which gives its name to the whole atoll, lies on the eastern side of the reef and is about 5 miles long. On the west, the atoll rim is broken by 6 passages, the northernmost of which has a general depth of over 10 fathoms. Inside the lagoon, anchorage can be found in depths of 17 fathoms, but there are shallow patches.

ONTONG JAVA (Fig. 214)

Ontong Java, a very large coral atoll, lies about 133 miles east-south-eastward of Tauu. It was discovered by Mendaña in 1568, but was given its present name by Tasman in 1643. An alternative name is Lord Howe atoll.

Physical Geography

From north-west to south-east Ontong Java is about 45 miles long; its greatest width is about 30 miles. The circuit of reef has not yet been properly surveyed, but at its widest it appears to be at least 2 miles across. The islands on the reef number about a hundred. Coconut palms grow on all of them. Luangia, the largest, is about 4 miles long and 300 to 400 yd. across at its widest point. There are 23 passages through the reef. Kaveiko pass, to the south of Luangia, leads to the main anchorage. It is about 100 yd. wide and is clearly defined, as the reef on either side is steep-to. Kaveiniu pass, $2\frac{1}{2}$ miles west-south-west of Kaveiko, is equally free from dangers; Hangupa pass, to the west of Keila island, is divided by islets and reefs into several small channels.

Social and Economic Conditions

Luangia and the smaller island of Pelau are the only centres of permanent settlement. The population, which is rapidly declining (p. 630), numbered 588 in 1939.

It is separated at its southern end from Bougainville by a strait (Buka passage) 2 miles long and scarcely $\frac{1}{2}$ mile wide.

A range of hills of volcanic origin follows the west coast and reaches a maximum height of about 1,300 ft. Parallel to this and fronting the east coast is a lower range of hills formed of coral limestone, terraced on their seaward slope. Between the two is a low plain covered by laterite. Mangroves fringe the west coast for long stretches, especially in the north. The remainder of the island is densely forested with a few areas of grassland.

The east and north coasts are steep-to and backed by wooded cliffs. Near Hanahan there are several sandy beaches. Cape Henpan, the northernmost point, is of moderate height, with many low islets off it. The west and south coasts from cape Dunganon southward are protected by a barrier reef, from 2 to 3 miles offshore, on which is situated a chain of about twenty small coral islets. The northern end of the lagoon thus formed (Nutunana channel) is known as Queen Carola harbour. It has good holding ground in 6-13 fathoms and an entrance suitable for large vessels. The entrance between Hetau island and cape Dunganon is divided by Malulu islet and the reef on which it lies.

Social and Economic Conditions

The population of Buka and its adjacent islands was estimated in 1940 at 7,608. The people are very dark-skinned Melanesians. Physically and culturally they are closely related to the inhabitants of Bougainville (pp. 631, 636). Villages are mainly on the coast. All consist of straight lines of huts fronting a clear space used for dances. Taro, the chief crop grown, and fish are the main items of diet. Cuscus and wild pigs are hunted but the latter are seldom obtained.

Due to the sheltered anchorage provided by the barrier reef, the west coast has experienced most European influence. Roman Catholics and Methodists have each established mission stations. There are five coconut plantations on the coast and a number of small ones on the reef islets. The government station for Buka and north Bougainville is on Sohana island in Buka passage.

BOUGAINVILLE (Fig. 215)

Physical Geography

Bougainville, the largest island in the Solomons, lies to the south of Buka, separated from it by Buka passage about $\frac{1}{2}$ mile wide. It stretches for about 127 miles from north-west to south-east and has a maximum width of about 49 miles.

The interior, which is still very imperfectly known, contains at least one massive mountain range following its length, known in the north as the Emperor range and in the south as the Crown Prince range. It contains the two active volcanoes of Balbi (10,171 ft.) and Bagana (9,850 ft.). The whole island is covered with rain forest, generally very dense, but more open on the summits of the highest mountains, with brakes of bamboo, tree ferns and abundant moss.

Only the south coast of Bougainville has been surveyed. There are few major bays or promontories. Off the low-lying south coast are a maze of shoals and coral patches extending to the Shortland islands (pp. 672-4). The coast is low-lying except for East point and Pupukuna point, flanking the entrance to Tonolai harbour. About 55 miles to the west of these is Matupina point forming the southern shore of Gazelle harbour in Empress Augusta bay. Northward from this point there are few features of note except a string of shoals and islets following the coast a few miles offshore from Belua to Buka passage. On the north from Buka passage to Tiop harbour there is a succession of limestone cliffs and a fringing reef. The east coast from Numanuma southwards is skirted by a discontinuous barrier reef.

Anchorage. The principal anchorages in Bougainville are Kieta harbour (pp. 664-5), Tonolai harbour and Empress Augusta bay.

Tonolai harbour, in the south-east of the island, is a long narrow pocket, 4 miles



Fig. 215. Bougainville and Buka

Names in roman capitals show the main tribal districts. Based on: (1) G.S.G.S. map no. 4344; (2) other official sources.

by $\frac{1}{2}$ mile, with depths of from 14 to 20 fathoms. Empress Augusta bay, in the south-west, is a large bay open to the west, with a small bight (Gazelle harbour), now said to be silted up at its southern end. Depths vary from 4 fathoms near the shore to 30 fathoms. The shore is fringed with mangroves and the hinterland is mountainous.

At many other points round the coast there are small anchorages where vessels have found shelter; most would only provide temporary shelter for small craft. On the west coast there is anchorage off Belua village, midway between the Tauri and Kiakaba rivers; and the barrier reefs northwards of this point might give temporary shelter, though the area has not been fully examined. Matchin bay, south of Buka passage, and sheltered by the islets of Madehas, Toiokh and Karij, provides suitable anchorage for large ships in 15 fathoms. On the northern end of the island there are small anchorages at Baniu, Raua and Tinputs, and on the east coast at Tiop and Numanuma.

Social and Economic Conditions

The native population of Bougainville was estimated in 1940 at 39,309, but since much of the interior is still unadministered this figure is only an approximation. On the coast, villages of 100 to 200 inhabitants are met with, but in the interior of northern Bougainville the settlements are no more than frequent groups of two or three huts. In the Buin area, in the south, population is much denser with numerous relatively large villages knit together into a strong political and social system of almost tribal type.

SHORTLAND ISLANDS AND TREASURY ISLANDS

The Shortland islands and Treasury islands (Fig. 216) lie to the south of Bougainville and west of Bougainville straits. The main islands in the former group are Shortland (lat. $7^{\circ} 05' S$, long. $155^{\circ} 53' E$, approx.) and Fauro. The latter group consists of Mono (lat. $7^{\circ} 24' S$, long. $155^{\circ} 35' E$, approx.) and Stirling. They are composed of both volcanic and sedimentary rocks. Their native populations are closely akin in physical type and culture to those of south Bougainville.

SHORTLAND

Shortland is composed of foraminiferal ooze deposits overlaid by coral limestone, except for a core of volcanic rock on the north-west coast. The small islands of Magusani, Poperang and Alu off the south-east coast are of raised coral and are presumably the elevated remains of a barrier reef. The interior of Shortland is undulating with several parallel ridges of hills 400 to 600 ft. high. On the north-west coast there are three bays separated from one another by sharp headlands. The south-west coast has a sandy beach fringed with coral. Elsewhere, for the most part, mangroves line the coast. Shortland harbour (Faisi) (p. 663; Plate 114) is a port of entry for the protectorate. The government station for the Shortlands district is at Banmagiai, overlooking the harbour. The native population totalled 472 in 1931. There is a coconut plantation on the south-eastern part of the island.

FAURO

Fauro, about 12 miles north-east of Shortland, is of a very irregular shape, measuring about 14 miles from north to south and varying in breadth from less than a mile to 6 miles. The main bulk, formed of lavas, tuffs and agglomerates, represents a heavily eroded volcanic cone cut into several peaks, the highest of which, Barbi-lele, is 1,925 ft. high. On the east coast, a long narrow peninsula projects at right-angles, terminating in the white-cliffed East cape. From the centre of the north coast runs a crescentic sandy-beached peninsula about 8 miles long with a chain of hills forming its spine. On the east it encloses North bay. Much of the east and north-west coasts of the main part of the island have sandy beaches, while there are

mangroves on the west and south-west coasts. Coral reef fringes the coast almost everywhere and to the south forms a discontinuous barrier, inside which are several anchorages. Toma harbour, a circular almost land-locked bay on the south coast, gives good protection in 17-20 fathoms.

Numerous small islets lie off the coast. Munia (not to be confused with Munia in Fiji), to the south on the barrier reef; Asie and Ovau, to the north-west; and Masamasa and Piedue, off the entrance to North bay, are the most noteworthy.



Fig. 216. Shortland islands and Treasury islands

Based on Admiralty chart no. 329.

All are very hilly and volcanic in origin. Between 8 and 12 miles north of Fauro are the small islands of Oema and Oema atoll; the latter is a series of volcanic rocks round which has grown a penannular atoll. The native population of Fauro in 1931 was 164.

MONO

Mono, of oval shape, 9 miles long and $5\frac{1}{2}$ miles broad, rises to 1,150 ft. above sea level. It has a core of volcanic rock on which are thick deposits of ooze overlaid by coral limestone. The last is 70-80 ft. thick at the coast, where it ends in abrupt cliffs but tapers off at the 500 ft. contour. Several streams have cut deep channels

through these deposits. Except on the north-east, where there is a sandy beach and anchorage in 20 fathoms, the coast is mostly steep-to. There were 199 native inhabitants in 1931.

STIRLING

On the south, separated by a channel about a mile wide from Mono, lies Stirling island, nearly 4 miles long and under a mile wide. It is of raised coral with a maximum height of about 70 ft. In origin it appears to be part of a raised barrier reef.

CHOISEUL (Fig. 217)

Choiseul, lying approximately between lat. $6^{\circ} 34'$ and $7^{\circ} 25' S$ and long. $156^{\circ} 25'$ and $157^{\circ} 32' E$, is nearly 90 miles long with a maximum width of about 20 miles.



Fig. 217. Choiseul

The names in roman capitals show dialect or tribal areas. Based on: (1) A. Capell, 'Notes on the Islands of Choiseul and New Georgia, Solomon Islands', *Oceania*, vol. XIV, p. 21 (Sydney, 1943-4); (2) official sources.

Before the war it had never been surveyed, except for the small area around Choiseul bay (Fig. 218) at the north-western end.

Physical Geography

It appears that the centre of the island is formed by a long ridge, level-topped and devoid of outstanding peaks. The north-eastern side is rugged and mountainous with the exception of a low-lying area near Cape Alexander, at the northern tip. The eastern end of the island is low-lying except for Taura peak (1,800 ft.). Cliffs as much as 100 ft. high occur in a few localities on the south-west coast. There are no major promontories with the exception of Sumbi and Sumbi heads, nearly midway along the south-west coast. The two bays adjoining them are the only large indentations. Both north-east and south-west coasts are protected by barrier

reefs some miles offshore; that on the northern part of the north-west coast appears to be continuous for about 50 miles.

Anchorage. There are few known anchorages off Choiseul, but more careful examination of the coast may reveal more. The most important is in Choiseul bay, in the extreme north-west of the island. Others of lesser importance are: near Kumbakale on the northern end of the north-east coast; Taura bay on the southern end of the same coast; and Sumbi and Mbambatana on the south-west coast.

Choiseul bay (Fig. 218) is an indentation into which four streams drain; most of its shore is fringed with mangroves. A barrier reef, on the inner edge of which are three small islands, lies between $\frac{1}{2}$ and $\frac{3}{4}$ mile offshore; the dimensions of the bay are about 3 miles by $\frac{1}{2}$ mile, with depths varying from about 10 to 18 fathoms.

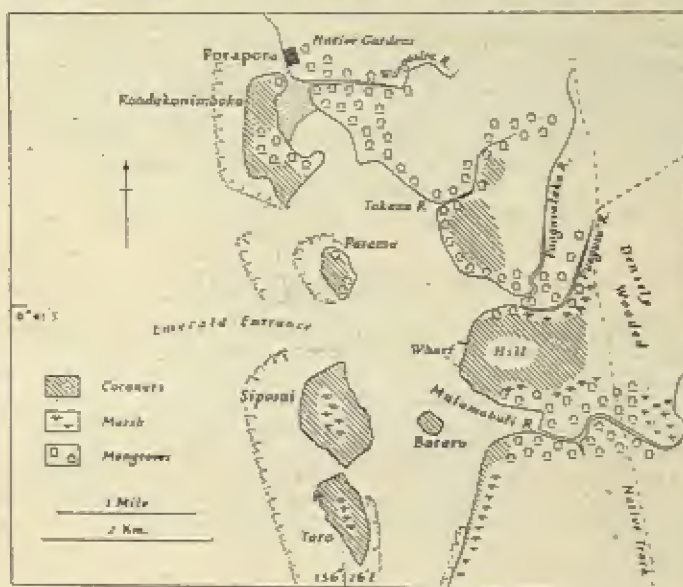


Fig. 218. Plantations at Choiseul bay

This map shows a typical coastal plantation area. Coconuts have been planted in the well-drained parts of the coastal belt and of the off-lying islands; and the planted areas are separated from one another by stretches of marsh and mangrove swamp. Native settlements have been little disturbed. Based on an official source.

There are three entrances, one between the main island and the southern end of the reef, and two at the north end of the harbour. The north entrance has a depth of 4 fathoms. The middle (Emerald) entrance has depths of not less than 18 fathoms, except for a patch of 3 fathoms in the middle, and a width of 300 yd. between the reefs. The southern entrance is about $\frac{1}{2}$ mile wide but with shallow patches near the entrance. A large vessel could use the anchorage but it is more suitable for small craft.

At Kumbakale there is an opening in the barrier reef about 300 yd. wide and anchorage has been found inside the reef about a mile north of it. Taura bay on the extreme south-east of Choiseul offers anchorage in about 16 fathoms. The many islands off the coast near this point may offer suitable places to anchor. On the south-west coast anchorages have been reported at Sumbi and Mbambatana.

Social and Economic Conditions

Judging by the number of deserted village and garden sites in the interior, Choiseul must recently have supported a large native population. In 1931, however, the total was only 4,051, concentrated entirely in the coastal areas. All the people are nominally Christian. There is a Methodist mission station at Mbambatana and a Roman Catholic station at Malavaga. There are several European coconut plantations on the coast near Choiseul bay (Fig. 218).

ISLANDS OFF CHOISEUL

Most of the off-lying islands occur in a cluster off the south-eastern end of the main island. These form a complex with small islets and shoals and heavy tide rips in the channels between them. The only islands of any size are Rob Roy, Dillimore and Vagina. Rob Roy, approximately triangular in shape with the addition of a long peninsula which almost meets the south-eastern end of Choiseul, is about 10 miles from east to west and about 6 miles from north to south. Dillimore, a rectangular island about 3 miles long, lies just off its south-eastern coast. About 6 miles to the east of Rob Roy is Vagina, a pentagonal island about 7 miles from north to south and from east to west; a large triangular lagoon off the east coast is enclosed by a barrier reef on which there are about 16 small islets.

NEW GEORGIA GROUP

The New Georgia group (Fig. 219) comprises eleven moderate-sized islands and numerous islets extending over an area about 130 miles from north-west to south-east and about 40 miles from north-east to south-west, approximately between lat. $7^{\circ} 32'$ and $8^{\circ} 50' S$ and long. $156^{\circ} 28'$ and $158^{\circ} 19' E$. New Georgia, the largest, is surrounded by islands on east, south and west. To the east lie Vangunu and Gatukai, separated from New Georgia by the narrow Njai passage. On the south, across the Blanche channel, are Tetipari and Rendova. On the north-west are Wanawana and Arundel. Further north, across the Kula gulf, is Kolombangara. In the extreme west are Gizo, Ganongga and Vella Lavella.

Social and Economic Conditions

Serious depopulation has occurred. The population of New Georgia itself has been estimated at about 15,000 before 1914, but it has since been much reduced, particularly by two dysentery epidemics. The remaining inhabitants have settled on the coast, particularly along the Marovo and Roviana lagoons. Culturally and physically they are more closely connected with the natives of Choiseul and Bougainville to the north than with those of the islands to the south-east. There are several mission stations on the coast. The Seventh Day Adventists are established at Batuna on Vangunu, at Vori point on the northern end of Ganongga and on the coast of Kolombangara opposite Gizo. The headquarters of the Methodist mission in the Solomons is at Kokenggolo on the Roviana lagoon.

NEW GEORGIA

New Georgia is about 50 miles from north-west to south-east with a breadth varying from about 5 to 30 miles. Most of the northern and western parts were unsurveyed before the war. Structurally, it appears to contain a group of volcanic peaks on its northern side, rising from 2,000 to 3,000 ft. About 16 miles to the south of Visuvisu point lies a group of three remarkable peaks, Kusage (2,696 ft.), Vina Roni (2,251 ft.)

and Vina Kiki. Between the mountains and the south-west coast is a fairly level plain about 200 ft. high. Forest covers the whole island.

The south-west coast forms a large arc, the north-western half of which contains the Roviana lagoon (Plate 115); the south-eastern half is steep-to with cliffs over 100 ft. high and devoid of coral. The lagoon, however, owes its existence to coral, being sheltered behind a series of flat-topped islands about 200 ft. high formed by the elevation of an ancient barrier reef. The lagoon is about 24 miles long and 4 miles wide, shallow and full of coral patches. At its western end it narrows to a



Fig. 219. New Georgia group

Villages shown all had a population of 100 or over at the time of the 1931 census. It has not been possible to show all large villages; smaller villages have been omitted. For Kokengolo read Kokenggolo. Based on: (1) British Solomon Islands Protectorate Lands Department map of the District of Gizo, 1934; (2) Admiralty charts nos. 2383, 2392, 2601; (3) *Report of the 1931 Census* (unpublished, Tulagi, 1931); (4) R. J. A. W. Lever, 'Economic Insects and Biological Control in the British Solomon Islands', *Bulletin of Entomological Research*, vol. XXVIII, p. 330 (London, 1937).

winding, mangrove-fringed passage between the western coast of New Georgia and the off-lying Baanga and Woodford islands. The north-west coast of New Georgia is more rugged with numerous river mouths and minor indentations. For 40 miles there is a continuous lagoon which also embraces the north and east coasts of Vangunu; the various sections are known from north to south as Tokovai, Grassi and Marovo lagoons. As in the Roviana lagoon, the barrier reef is raised to form a string of islets. Most of the passages between are choked with coral; few are navigable. On the south coast a broad promontory projects almost to the island of Vangunu; immediately westward of the promontory is a deep bay flanked on

the west by the narrow Maloko peninsula, which is continued southward for about 14 miles as a coral reef dotted with islands.

Anchorage. There are few good anchorages. Viru harbour, an inlet on the south coast, $1\frac{1}{2}$ miles long, 200 yd. wide at the entrance and from 7 to 12 fathoms deep, is the only important anchorage. Roviana lagoon, used by local trading vessels, has possibilities as an anchorage and as a seaplane base. Parts are obstructed by coral. There are several passes through the barrier reef on the north-east coast. On the north-west coast there are anchorages offering protection for small vessels in several of the inlets facing Kula gulf. Anchorage is also obtainable in Hathorn sound between New Georgia and Arundel island.

VANGUNU

Vangunu is a roughly circular island 16 miles in diameter, with an extremely indented coastline. It appears to be in origin a single highly dissected volcanic cone 3,686 ft. high, with a large crater overlooking the south coast. The land falls gently in densely wooded slopes to the coast. Two hilly promontories project from the north coast. The Marovo and Kolo lagoons between the north and east coasts and the barrier reef are shallow and full of coral patches. There is hardly any fringing coral. On the south-east and north-west there are mangroves. The Marovo lagoon has ample depth for anchorage but there are several shoals. It could provide shelter for several large ships or could be used as a base for seaplanes. Ringdove bay in the south-west of the lagoon, with from 5 to 19 fathoms, is very well sheltered, but the approach is narrow.

GATUKAI

The island of Gatukai, about 8 miles across, lies 5 miles from the south-west coast of Vangunu. The summit is a volcanic cone, 2,912 ft. high, to the west of which are flat and fertile tablelands. A broad peninsula on the east side ends in a bold cliff about 150 ft. high. Except on the north, where a limestone peninsula forms the southern end of the elevated reef containing the Marovo lagoon, the coast is steep-to. A similar section of raised reef almost links the western tip of Gatukai with Vangunu. The western side of Gatukai is unapproachable except for small vessels, but Wickham anchorage off the south-west coast and sheltered by an off-lying island offers protection in 24 fathoms. The lagoon near Paeva village on the eastern extremity is used as an anchorage by trading craft but is too small for large vessels.

TETIPARI

Tetipari, about 16 miles long by $4\frac{1}{2}$ wide, is little more than a long hog-backed ridge, densely wooded and with fairly steep cliffs on the south, falling to a sandy beach fringed with coral. Further cliffs front the eastern section of the north coast, which is steep-to. Anchorage can be found in Waugh bay in 27 fathoms, where there is a small rubble pier with 10 ft. of water alongside.

RENDOVA

Rendova is a rectangular island about 16 miles long from north-east to south-west; a peninsula 9 miles long continues the line of the southern coast south-eastwards. The whole of the southern coast including the peninsula is backed by a precipitous mountain ridge with heights up to 2,410 ft. Other mountains occupy the interior of the rest of the island, culminating in Rendova peak (3,488 ft.), a volcanic cone with an extinct crater. Coral fringes the southern coast of the peninsula and forms a barrier enclosing a large lagoon on the north-west coast; otherwise the shores are steep-to.

The only anchorages are in Rendova harbour (15 fathoms) just west of the north point of the island and protected by a chain of reefs and islands, and in Renard cove (15 fathoms). There is a small pier at Rendova harbour.

ARUNDEL AND WANAWANA

These two islands, separated by the Wanawana lagoon, are surrounded by one reef system which forms barriers at either end of the lagoon. They are flat, with the exception of low hills in the western end of Wanawana and towards the south of Arundel. The mangrove-fringed inner shores fronting the lagoon are infested with crocodiles. The outer coasts are steep-to and afford no anchorage.

KOLOMBANGARA

Kolombangara, almost circular with a diameter of 16-20 miles, is a fine example of an extinct volcano. Seven of the peaks on the rim surrounding the crater rise to heights around 5,000 ft. Two gaps on south-west and south-east give a view of the precipitous cliffs on the inside of the rim. Except to north-east and south-west, where there are several minor peaks, the island slopes down gently from the crater to a slightly indented coastline, which is steep-to. Mangroves front some of the small inlets; the encircling reef is in part fringing and in part forms a barrier close inshore. There are many creeks round the coast, but the entrances to most are blocked by coral.

GIZO

Gizo, about 8 miles long and about 3 miles wide, lies some 8 miles to the south-west of Kolombangara. It appears to be of coral limestone formation with few distinctive features. In the interior it attains a height of 654 ft. near Titiana point, the only major promontory on the south coast. The north-east coast is deeply indented with three long narrow bays separated by promontories. Reefs of both fringing and barrier type occur off the north-east coast and extend in a big loop south-eastwards for 8 miles, enclosing several small islets.

Gizo anchorage (p. 664) is the only one in the island. To the south of the anchorage on a small peninsula is the government station, the headquarters of the Gizo District.

SIMBO

Simbo (lat. $8^{\circ} 15' S$, long. $156^{\circ} 32' E$), often incorrectly called Narovo and sometimes called Eddystone, is about 4 miles long from north to south. It consists of two parts, formerly separate islands of volcanic origin, now joined by a low and narrow isthmus of coral limestone. The southern half contains two main peaks, South hill and Middle hill, between 1,000 and 1,100 ft. high, with several dormant craters and numerous active solfataras, fumaroles and hot springs. A narrow channel on the eastern side separating it from Simbo islet is so hot that steam rises from its surface. The northern half is fringed with a broad coral reef. In a small bay on the western side of the isthmus is the anchorage in 9-15 fathoms, sheltered from the north by a fringing reef and from the west by a detached reef.

GANONGGA

Ganongga, an island about 16 miles long and averaging 5 miles broad, lies about 6 miles northward of Simbo. With the exception of low-lying areas at the north and south ends, it is hilly, mount Kela rising to 2,000 ft. There are terraces marking former sea levels, at 400, 800, 1,200 and 1,600 ft. The coast is little indented, with

fringing reef at northern and southern ends; east and west coasts are steep-to. Owing to heavy swell there is no good anchorage, but temporary anchorage can be found in Koreovuka harbour at the northern end and at Kumbokala and other points round the coast.

VELLA LAVELLA

Vella Lavella, about 14 miles north-westward of Kolombangara, is an irregular shaped island about 30 miles from north to south. The densely wooded interior is of rugged volcanic formation with heights up to 3,000 ft. Around the northern part of the island the coast is indented by numerous river mouths and small bays. The south-western coast is a succession of large bights separated by promontories fringed with reef. Off Esorolando point, the southern tip, lies the small island of Liapari. Both this and the larger circular island of Baga off the south-west coast are covered with plantations. Reef fringes the north-western coasts and forms a discontinuous barrier to the north-east.

The numerous small bays offer indifferent anchorage to trading schooners (Plate 117). The best anchorage is in Java bay, in 20 fathoms.

YSABEL

Ysabel (Fig. 220), discovered by Mendaña in 1568, lies approximately between lat. $7^{\circ} 30'$ and $8^{\circ} 34' S$ and long. $158^{\circ} 26'$ and $159^{\circ} 54' E$. The main island is about 92 miles long, excluding Barora Fa and Gage islands at the northern end. Its greatest width is about 19 miles.

Physical Geography.

Structurally the island is a single chain of volcanic mountains which in most parts dip gently to a low-lying coastal strip. The whole island is forested. The long south-west and north-east coasts each possess a discontinuous barrier reef, often 3 or 4 miles offshore. Parts of the reef on the latter coast have been raised sufficiently to form islands several miles long, such as Fara and the Gijunabeans islands. The reef is in few places sufficiently continuous to form a sheltered lagoon, as at Maringe and in the Austria sound region at the northern end of Ysabel. Local stretches and patches of reef occur on all coasts. On the shores of the narrow bays and channels of Austria sound and in the region of Thousand Ships bay and Tanambuli at the southern end, mangroves fringe the shore.

Anchorage. The most important anchorages on Ysabel are in Thousand Ships bay and at Tanambuli, on the extreme south-eastern end of the island, and in Maringe lagoon and Rekata bay, on the east coast. There are a few small harbours behind the barrier reef on both coasts, but before the war they were little used and inadequately surveyed. Among the sounds and islands off the north-west end of Ysabel there are opportunities for small vessels to find shelter.

Thousand Ships bay is a stretch of water open to the south-east but protected on other sides by high hills. A narrow channel with a depth of about 2 fathoms leads from the landward end of the bay behind San Jorge island to the sea. The bay is roughly 3 miles wide and 7 miles long. Depths vary considerably and there is much coral inside. The shores, which are fringed partly with coral and partly with mangroves, have many bays, some of which form anchorages. On the south side are Astrolabe bay with depths of 18 fathoms, good shelter and room for small craft. Albatross bay immediately to the north of it is well protected but small. On the north side is Cockatoo anchorage which is larger and provides excellent shelter. Vulavu anchorage outside is only suitable for small craft.

Tanambuli bay on the north side of the Bugotu peninsula is a fork-shaped

anchorage protected on the seaward side by an island. The entrance is about 500 yd. wide and the width inside about $\frac{1}{2}$ mile. Its depth is from 20 to 30 fathoms.

Maringe lagoon near the southern end of the east coast is an anchorage protected by a chain of islands. The lagoon is roughly 7 miles long and from 1 to $1\frac{1}{2}$ miles wide. Depths vary from 45 fathoms near the main entrance to about 10 fathoms near the shore; it could hold a large number of ships. Rekata bay at the northern end of the same coast is a large stretch of water open to the north-west but enclosed on the north-east by the Gijunabeana islands ranged on the inside of the barrier reef. It is about 7 miles long and from 2 to 3 miles wide; depths vary considerably. The approach from the west is by channels on each side of a shoal known as



Fig. 220. Ysabel

Villages shown all had a population of 100 or over at the 1931 census. Names in roman capitals show major divisions as given on the Lands Department map of Ysabel. Based on: (1) British Solomon Islands Protectorate Lands Department map of Ysabel District, 1934; (2) *Report of the 1931 Census* (unpublished, Tulagi, 1931); (3) R. J. A. W. Lever, 'Economic Insects and Biological Control in the British Solomon Islands', *Bulletin of Entomological Research*, vol. XXVIII, p. 330 (London, 1937).

Penrose patches. Another entrance is to the northward, between the two largest of the Gijunabeana islands. Many ships could find shelter in the bay. (It was used by the Japanese for both large vessels and seaplanes.)

Social and Economic Conditions

The native population of Ysabel was 4,219 in 1931. It appears certain that there has been considerable depopulation. The inhabitants were formerly subject to frequent headhunting raids from New Georgia. Today the chief areas of settlement are in the Bugotu district and at the northern end of the island in the Kia district. The only mission station is that of the Melanesian Mission on the Maringe lagoon.

The lower lands on the north-east coast have been extensively planted with coconuts. There is also one European plantation on the south-west coast. The government station is at Tanambuli in the Bugotu district.

ISLANDS OFF YSABEL

At the northern end of Ysabel a complex group of islands extends north-westwards; off the northern end of the east coast there is the small group of the Gijunabeana islands; and at the southern tip of Ysabel is the larger island of San Jorge.

The central mountain spine of Ysabel extends beyond Kia passage in the long rectangular island of Barora Fa, known also as Barola, about 15 miles long with a maximum width of about 4 miles. It contains six peaks over 600 ft., one of which reaches 914 ft. Separated from its north-western end by the narrow Popu channel is the E-shaped island of Gagi which rises to 955 ft. in mount Beaumont. On the north-eastern side are two narrow almost land-locked bays. Farther north-west, beyond the wide Kologilio passage, is a group of nine islands. Westward again is the broad Manning strait with the Arnavon group of islets in its centre, about 4 miles from Molakobi. They consist of Sikopo and Kernikapa. Both are crescentic and appear to be remnants of raised atolls.

Immediately south-west of the Kia passage is the long, deeply indented island of Barora Ite, which has a length of about 7 miles and a greatest width of about $4\frac{1}{2}$ miles; it has three main peaks. To the south, across the Rob Roy channel, are the islands of Langton and Nidero. Eastward, beyond Austria-sound, is the rectangular island of Bero with a 620-ft. hill in the centre. To the south of Bero are Anker, Captain and Lieutenant islands, protected from the open sea by a barrier reef on which are several small raised islets.

The Gijunabeana islands extend up to 4 or 5 miles off the east coast to enclose Rekata bay. Two chains of small islets run parallel to them, one within the bay and the other on the barrier reef to seaward. The southernmost island of the main chain is Papatura Ite, a little over a mile long; next in order is Papatura Fa, which, separated from the mainland by a channel a few hundred yards wide, is the largest, being nearly 5 miles long and 2 miles wide.

San Jorge (St. George's island), separated from the mainland by the Ortega channel, at its narrowest about $\frac{1}{2}$ mile wide, is about 15 miles long with a greatest width of about 9 miles. It contains three peaks over 1,000 ft.; the highest is 1,290 ft. high.

RUSSELL ISLANDS

The Russell islands (lat. $9^{\circ} 05' S$ and long. $159^{\circ} 10' E$), known locally as 'Cape Marsh' or 'the Cape', lie approximately south-westward of Gatukai (Fig. 200). They consist of the two main islands of Pavuvu and Banika, surrounded by numerous small islands and reefs. They were discovered by Captain Manning in the *Pitt* in 1792.

Physical Geography

Banika and Pavuvu are formed of basalt, overlaid by coral limestone, which has been denuded from the heights above 500-600 ft. Pavuvu is an irregularly shaped island about 10 miles from east to west and rising to 1,600 ft. The southern coast is formed of three wide bays separated by two broad promontories, cape Bola and cape Baloka. The north coast is a sequence of long narrow promontories divided by bays and creeks; midway along this coast is a long peninsula which expands at its extremity to enclose the semicircular Pepesala bay. The east coast of Pavuvu fronts the narrow Sunlight channel, which separates it from Banika. The latter is



Plate 116. Utuha passage, Nggela

View taken at Siota of the narrow channel which cuts Nggela in two.



Plate 117. Anchorage, Liapari plantation, Vella Lavella

In the foreground is a small boat jetty for loading copra.



Plates 118 and 119. Halavo and Honggo villages, Nggela
Typical coastal villages with the houses scattered through coconut groves.

about 4 miles across from east to west and about 8 miles from north to south. Somewhat to the west of the centre is a peak 400 ft. high. Three long narrow coves run inland, each for about 2 miles—Lingatu on the south-west, Tillotson on the north-west and Renard sound on the north-east. The northern fringe of the group is bordered by a barrier reef with many islets 10-50 ft. high; the largest, Baisen, Leru and Mane, have cliffs 100 ft. high. Numerous similar islands without reef are scattered to east and south of Banika and Pavuvu. The anchorages in most use appear to be in West bay and Pepešala bay on Pavuvu and in Renard sound on Banika. About 18 miles to the west of the Russell islands lies the volcanic island of Buraku. It is 1,000 ft. high, fringed with coral, and uninhabited.

Social and Economic Conditions

In 1931 the native population of the Russell islands was 199. On account of the suitability of the limestone soil for coconut cultivation large areas have been acquired for coconut plantations, notably by Lever's Pacific Plantations. Their sites appear to be determined by the anchorages available in the group. Yields of copra are high, reaching a ton per acre per annum. So far the palms have been immune from immature nut-fall. Steamers from Sydney and Tulagi call at about six-weekly intervals.

NGGELA

The Nggela group (Fig. 221), lying between Guadalcanal and Malaita, extends approximately between lat. $8^{\circ} 52'$ and $9^{\circ} 12' S$ and long. $160^{\circ} 00'$ and $160^{\circ} 25' E$. It comprises the main island of Florida (Nggela), the smaller islands of Olevuga and Vatilaiu to the west of it and numerous islets off their coasts.

Physical Geography

All the main islands are mountainous, and covered with forest except for a few grassy tracts. Florida is about 25 miles long from east to west and 8-10 miles across. The highest point, mount Barnett, at the western end of the island, rises to 1,366 ft. There are many other hills about 1,000 ft. high. The north coast consists of three wide and shallow bays separated by broad headlands. The western and southern coasts by contrast present a complex array of narrow promontories and indentations with numerous off-lying islets. One of these indentations, Port Purvis, is continued inland as Utuha passage (known locally also as Mbolu pass—Plate 116), which completely cuts the island in two. Sheltering Port Purvis on south and south-east is a peninsula, the shores of which are deeply cut into numerous bays and promontories. Fringing reef is present on considerable stretches all round the coast, and the inlets on the south coast are mostly fringed with mangroves, though there are occasional sandy beaches (Plate 118). Relatively shallow water with patches of reef extends from this coast almost as far as Guadalcanal.

Anchorages. The south side of Nggela, with its deep indentations in the coast and the entrances to Sandfly passage and Utuha passage, provides numerous good anchorages. Sandfly passage, dividing Florida from Olevuga, is $\frac{1}{2}$ mile wide and 45 fathoms deep at its southern entrance. The depths lessen gradually to about 10 fathoms at the northern entrance. Inside the south entrance the passage widens into a bight about 3 miles across, with indented shores. The bottom is irregular and tidal streams up to 3 knots are met with. With local knowledge, anchorage can be obtained out of the currents. Tulagi and Gavutu harbours (pp. 662-3) occupy a large part of the coast east of Sandfly passage. Eastward of Gavutu and separated from it by a narrow peninsula is Hutchison creek, about $\frac{1}{2}$ mile wide and 14 to 30 fathoms deep at the entrance, narrowing to about 200 yd. a mile from the mouth. Port Purvis, immediately to the east of Hutchison creek, has a narrow entrance

$\frac{1}{2}$ mile wide and 45 fathoms deep. Inside the entrance it opens out into a wide, deep harbour surrounded by hills as high as 800 ft. The greater part of the shore is fronted by mangroves and fringed by coral reefs. There are several indentations and deep water approaches close inshore. The harbour offers complete protection with anchorage in depths of 10-30 fathoms. The northern entrance through Uruha passage is about 4 miles long and has depths of about 10 fathoms. It is winding and though mostly 500-1,000 yd. wide, is narrow in parts; it is used primarily by small craft.

In the south-east are two or three anchorages offering slight protection for small



Fig. 221. Nggela

Villages shown all had a population of over 100 at the time of the 1931 census. The roads shown have only recently been formed; their course is only roughly indicated. Based on: (1) British Solomon Islands Protectorate Lands Department map of Nggela District, 1933; (2) *Report of the 1931 Census* (unpublished, Tulagi, 1931); (3) other official sources.

vessels. The most westerly of these, Baranago harbour, with its entrance protected by Bungana island, provides excellent shelter in 16 to 18 fathoms for small craft in the trade wind season. Tanatau cove (Schooner cove) is used occasionally by small trading vessels. Matumba bay is a long narrow indentation open to the south-east winds and affording indifferent anchorage in 10 fathoms.

On the north coast the only anchorages are Mboli harbour at the entrance to Uruha passage, and Vura anchorage. There is indifferent anchorage in 8 fathoms in the former. The latter offers anchorage in 4 to 5 fathoms west of the point of Anuha island.

Social and Economic Conditions

The native population of the Nggela group, including Tulagi, Makambo and Gavutu, was 4,563 in 1931. On Nggela the people live in villages distributed round the coast (Plate 119). On Tulagi, Makambo and Gavutu there is ordinarily a considerable temporary population engaged in wage labour. Europeans in Nggela and Savo numbered 94 in 1931. Tulagi (p. 663) is the administrative centre of the protectorate. Makambo and Gavutu are the local headquarters of Burns, Philp (South Sea) Company, Ltd., and Lever's Pacific Plantations, Ltd., respectively. The training centre of the Melanesian Mission is at Siota and the Bishop of Melanesia resides at Taroaniara, at the entrance to Port Purvis.

SAVO

Savo (lat. $9^{\circ} 08' 5''$ S, long. $159^{\circ} 49' E$) lies about 40 miles south of the southern tip of Yasabel. It is a circular island about $3\frac{1}{2}$ miles in diameter, and is a perfect example of a quiescent volcano. The cone, at the summit of which is a crater about 150 yd. across and 250 ft. deep, is well dissected. From all sides straight torrents stream down, their gravelly beds presenting the appearance of white roads leading to the coast. The slight cliffs have been raised a little so that they are now out of reach of the waves and covered with vegetation. Hot springs and deposits of sulphur occur round the coast. The shore is steep-to, as the island stands in water 500-600 fathoms deep. Anchorage can be found off the village of Koela on the north-west in from 10 to 20 fathoms and off Kuikuila on the south-west in 10 fathoms.

The native population has been very little affected by western influences. Their villages are well built and their gardens prosper in the rich volcanic soil. Native craftwork including wood-carving, and the inlaying of canoes still flourishes. The island is noted for its extensive megapode laying-grounds which are jealously guarded by the natives, who relish the eggs. The native population in 1931 was 747. All the villages lie on a track which encircles the island.

MALAITA

Malaita (Fig. 222), often known locally as Mala, lies approximately between lat. $8^{\circ} 19'$ and $9^{\circ} 36' S$ and long. $160^{\circ} 33'$ and $161^{\circ} 24' E$. The length of the island from north-west to south-east is about 104 miles and its greatest width about 23 miles. At its southern end, separated by the narrow and tortuous Maramasike passage is Maramasike island, known also as Little Mala and as Small Malaita, which can be considered as a part of Malaita.

Physical Geography

The island is basically of volcanic formation with superficial deposits of coral limestone on the lowlands near the coast. Forested mountain ranges follow its main axis. Mount Kolovrat (4,275 ft.) is the highest point. The interior is for the most part unsurveyed. Maramasike is a lozenge-shaped island about 32 miles long formed of a single chain of hills. Mangroves are frequent where the coast is flat. Discontinuous but well-developed coral reefs of fringing and barrier type are present on west, north and east coasts. The barrier reefs have in some cases been raised to form a chain of islands protecting a lagoon. Examples are to be seen in the region of Wairokai bay on the south-west coast and in the Langalanga lagoon, further north on the same coast. Except in the south-east, deep inlets are few.

Anchorage. Anchorages are numerous, but few are large or important. On the east coast the best are Deep bay and Double bay. Deep bay situated at the northern end of the Maramasike channel is about 2 miles long and 1 mile wide with anchorage



Plate 120. Auki, Malaita

The government station for the Malaita district is situated at the head of a bay in the lagoon. Note the rugged nature of the interior.



Plate 121. Tikopia: the south-east coast

Note the fringing reef and the rocky pinnacle of Fonga te Koro.



Plate 122. Sikaiana: houses in lagoon

Houses on piles in the lagoon with part of an outrigger canoe showing in right foreground.



Plate 123. Sikaiana: modern type of house construction

House with walls covered partly with strips of native matting and partly with imported planking.

Social and Economic Conditions

Malaita has been less affected by the general decline in population than most islands in the protectorate. The natives numbered over 34,000 in 1931. They are sturdier than most Solomon islanders, and many of the young men serve as indentured labourers. As a consequence there are few villages without economic contacts with Europeans; cash and imported goods bought with wages are in use everywhere, though nearly half of the population are still heathen. There are about a dozen mission stations with European staff around the coasts: six are maintained by the South Seas Evangelical Mission, four by the Marist Fathers, and two by the Melanesian Mission. These have encouraged the general coastward drift of the population, though there are many villages still in the interior. The Malayta Company (the interests of which have now been acquired by the Fairymead Sugar Company) had an extensive coconut plantation between Kwa cove and Su'u harbour on the west coast.

ULAWA

Ulawu lies about 20 miles eastward of Sa'a in Maramasike. About 12 miles long from north to south and with a greatest width of about 7 miles, it has a high ridge forming its axis. The highest point, Poro'u'ua, is 1,200 ft. high. The ridge falls steeply to the east coast. At the northern end of the island is the Ngorangora peninsula. The west side of this forms Su'umoli harbour, with temporary anchorage in 11-15 fathoms. There is a boat jetty built to serve the adjoining coconut plantation. The east coast is sandy with a fringing reef, while the west is formed of low cliffs of coral limestone and has no reef. The population, which was estimated at 928 in 1931, is culturally akin to that of Malaita.

RAMOS

Ramos lies in Indispensable strait about 22 miles westward of cape Astrolabe, the north-western extremity of Malaita. It is a small island about $1\frac{1}{4}$ miles long, surrounded by a broad fringing reef; just to the north of the reef are four small rocks.

NDAI

Ndai, 24 miles to the north of cape Astrolabe, was discovered in 1767 by Captain Carteret in the *Swallow* and given by him the name of Gower island. It is wooded and about 5 miles long from north to south and about 2 miles wide. The shore is fringed with reef and affords sheltered anchorage only in a bay near the southern end of the west coast. It is enclosed by a sunken reef through which there is a deep passage about 200 yd. wide. Anchorage inside the reef is in 3-6 fathoms. There is a village on the north-east corner of the bay.

SIKAIANA

Sikaiana atoll consists of a group of small islands charted approximately in lat. $8^{\circ} 20' S$ and long. $162^{\circ} 40' E$, but reported in 1933 to lie 13 miles to the east of this position. The atoll is often known as Stewart island. The islands were discovered by Captain Hunter in 1791. Later they were frequently visited by whalers. Their names are Sikaiana, Faore, Manduiloto, Barena and Matu Avi. Sikaiana, the largest, is 150 ft. high and about $1\frac{1}{4}$ miles long. The triangular reef on which they are situated is so steep-to that vessels can approach to a distance about 200 yd. Westward of Faore island there is a boat passage into the lagoon, very difficult of access at low water.

The inhabitants, who numbered 235 in 1931, are of almost pure Polynesian type with a slight admixture of Micronesian characteristics (Plates 97, 98). Culturally, they are akin to the Tikopia (p. 696), though their ancient culture has been more modified by frequent contacts with Europeans (Plates 122, 123).

GUADALCANAL

Guadalcanal (Fig. 223) lies approximately between lat. $9^{\circ} 15'$ and $10^{\circ} 00' S$ and long. $159^{\circ} 35'$ and $160^{\circ} 50' E$, and is the largest island in the protectorate. Its length is about 80 miles, its average breadth 25 miles, and its area about 2,500 sq. miles.

Physical Geography

The island is mainly of volcanic formation with an irregular chain of mountains following the southern shore fairly closely but separated from the north coast by



Fig. 223. Guadalcanal

Villages shown all had a population of over 100 at the 1931 census. Based on: (1) British Solomon Islands Protectorate Lands Department map of Guadalcanal District, 1937; (2) Admiralty chart no. 1469; (3) R. J. A. W. Lever, 'Economic Insects and Biological Control in the British Solomon Islands', *Bulletin of Entomological Research*, vol. xxviii, p. 330 (London, 1937).

gently sloping plains. The highest, mount Popomanasiu (8,005 ft.), is near the centre of the south coast; there are a number of other peaks in a range behind it from 7,000 to 7,500 ft. high. Rivers are numerous and follow direct courses to the sea. Those flowing northwards, such as the Balesuna, Berande and Bokokimbo, are in many instances over 20 miles long. All are subject to sudden spates. The whole island is densely wooded with the exception of the western part of the northern plain, where there are extensive areas covered with *alang-alang* grass.

The coasts have few major indentations or off-lying islands, except at the eastern end, where Malapa, Beagle, Komachu and several smaller islands enclose the harbour of Marau sound. The north coast as a whole is featureless with sandy

beaches for most of its length. Sand bars block the entrances to the rivers (Plate 92) except after heavy rains. A group of three islands, the Rua Sura islands, lies about 10 miles eastwards of Aola bay. Moderate depths are the rule close inshore. By contrast the southern coast, backed by massive mountains, is steep-to. Coral reefs are well developed only around Marau sound and the Rua Sura islands; patches of fringing reef occur on promontories on south and west coasts.

Anchorage. Marau sound (Plate 91), off the eastern end of Guadalcanal and enclosed by reef and numerous islands, forms a large area of water suitable for anchorage; but some of the passes between the reefs are narrow. On the north-east coast there are anchorages for small craft in Korai bay and on each side of Rere point. Kaukau bay, while large, is too deep for anchorage except close inshore in a depth of 27 fathoms. On the north coast there are few regular anchorages, but in the south-east trade wind season ships can anchor almost anywhere outside the 10-fathom line. Aola bay (Pope's anchorage, 10 fathoms), where the government station for the Guadalcanal District is situated, has two piers. Good shelter is also provided in Berande bay (10 fathoms) and on each side of Lunga point. On the western side of the island are indifferent anchorages, mostly dangerous in on-shore winds, in Coughlan harbour (9-11 fathoms), in Popau harbour, Ovi harbour, Beaufort bay (10 fathoms), Wanderer bay (6 fathoms), Aowaya bay (20 fathoms) and to the north-west of cape Hunter (12 fathoms). On the south coast anchorage is probably available at Talisi.

Social and Economic Conditions

In 1931 the native population of Guadalcanal was 14,215. The ending of inter-group warfare, the attractions of a readily available supply of fish, and the inducements of the missionaries have all tended to concentrate the population on the coast—mainly the northern coast. The coast dwellers depend mainly on fish, yams and coconuts; taro is the staple crop of those still living in the interior. Several large coconut plantations have been developed along the north coast, but all these have suffered severely from immature nut-fall. The government station is at Aola. Alluvial gold mining was begun in 1937 on the Sorvohio and Tsarivonga rivers; over 900 oz. of gold were exported in 1941.

SAN CRISTOBAL

San Cristobal (Fig. 224), known also locally as Makira, was discovered by Mendaña in 1568. It is about 70 miles long from north-west to south-east, with a maximum width of about 24 miles. Its western end is about 33 miles south-east of Guadalcanal.

Physical Geography

The bulk of the island is composed of ancient volcanic rocks, which form a series of mountain ranges running parallel to the main axis of the island. They are weathered into two long, flat-topped and gently rounded ridges which descend to form spurs 800-1,000 ft. high on the north coast. The highest point (4,100 ft.) lies about 30 miles from the south-eastern end. The island is densely wooded. The southern coast is a succession of long narrow inlets separated by small promontories. The whole coast rises precipitously from the sea in black cliffs. At its eastern end is the long, narrow peninsula of cape Surville. There are many short stretches of fringing reef, particularly round the promontories. The north coast, with the exception of the section from cape Kibeck to Flat rock, is backed by a strip of level land of varying width overlaid with coral limestone. The two major bights in this coast are Star harbour, at the eastern end, and Wanoni bay, about 26 miles north-westward.

* a n (Pacific III)

Anchorage. Anchorages are small, and few are well surveyed. On the south-west coast the best protection is to be found in Makira bay, which is completely surrounded by steep hills and has an entrance only $\frac{1}{2}$ mile wide. There are depths inside of 25-30 fathoms, but space is too restricted to permit its use by very large ships. Anchorage can also be found behind Yanuta island in 13 fathoms and in Marunga harbour (8-12 fathoms). The eastern half of this coast is little known, and no anchorages are recorded.

Along the north coast the best anchorage is in Star harbour, protected by a projecting reef and with depths of 10-12 fathoms. Other anchorages on the same coast include Wanoni bay (in 8 fathoms) and Wango bay (in 7-10 fathoms). On the



Fig. 224. San Cristobal

Villages shown all had a population of 100 or over at the 1931 census. Names in roman capitals show major divisions as given on the Lands Department map of San Cristobal. Based on: (1) British Solomon Islands Protectorate Lands Department map of San Cristobal District, 1934; (2) *Report of the 1931 Census* (unpublished, Tulagi, 1931); (3) R. J. A. W. Lever, 'Economic Insects and Biological Control in the British Solomon Islands', *Bulletin of Entomological Research*, vol. XXVIII, p. 330 (London, 1937).

west side of the island ships can anchor in Hada (Récherche) bay in 10 fathoms. Small craft can also find shelter in Hada Meta, $1\frac{1}{2}$ miles to the south.

Social and Economic Conditions

The combined populations of San Cristobal, Santa Ana, Santa Catalina and Ulawa were 6,267 in 1931. A figure of about 5,000 is likely for the main island. As in Guadalcanal, the interior has been depopulated and most of the people live on the north coast. In the eastern and western ends—the Wainoni and Arosi districts—they are organized in several totemic clans; those in the central area possess instead a dual organization. The population in general has enjoyed a high reputa-



Plate 124. Road on the north coast of Bougainville

This road, shown on Fig. 215, is maintained by local native labour under the direction of the District Officer. The boys in the foreground are wearing the *upi*, initiation hats made from palm leaves stitched together over a bamboo frame.



Plate 125. Village on Santa Ana

This village has been built under European influence with the houses ranged in straight lines.



Plate 126. Graciosa bay, Ndeni

The site of Mendaña's Spanish settlement in 1595 and the scene of the murder of Commodore Goodenough in 1875.



Plate 127. Te Motu village, Ndeni

The local type of village with circular palm-thatched huts enclosed by dry-stone walling.

tion for the fine quality of its shell inlay work and for the painted designs on canoes (Plate 195). Coconut plantations exist at Star harbour, Wanoni bay and several other points on the north coast. The headquarters of the San Cristobal District is at Kirakira, to the west of Wanoni bay. Native tracks are the only means of communication.

ISLANDS OFF SAN CRISTOBAL

Ugi (lat. $10^{\circ} 15' S$, long. $161^{\circ} 44' E$) lies approximately 5 miles from the north coast of San Cristobal. It is 7 miles long from north to south and about 4 miles broad. It is formed from pteropod ooze, overlaid on the lower ground by coral limestone. In the centre are three hills, the central one of which is 670 ft. high. Fringing reef surrounds the island except on the west, where Selwyn bay provides good anchorage in 17-20 fathoms. The northern part of the bay provides shelter in the north-west monsoon season. The population in 1931 was 230. There is a Melanesian Mission school. The small oval island of Bio lies to the north-west, separated from Ugi by a channel 2 miles wide.

Olu Malau, known also as the Three Sisters, is a group of three islands of coral limestone from 230 to 250 ft. high, lying about 12 miles eastward of Ugi. They were discovered by Mendaña and named by him Las Tres Marias. Malaupaina, the most southern, is about 4 miles long. Malaulalo and Aliiti, the central and northern islands, are each about 2 miles long. All are marshy, densely wooded and fringed with coral reef. They are uninhabited.

Santa Ana is a roughly circular island about $2\frac{1}{2}$ miles in diameter lying $4\frac{1}{2}$ miles eastward of cape Surville. In origin it is a raised coral atoll. Its highest point (520 ft.) overlooks the east coast. The surface is densely wooded except for some cultivated patches. Port Mary, on the western side of the island, is a reef harbour about 400 yd. wide at the entrance, narrowing to 250 yd. with a depth of 15 fathoms; it is a good anchorage except in the north-west monsoon. The native name for the island is Oa Raha. In 1928 the population was 356, divided between three villages (Plate 125). The people still retain much of their ancient way of life, though for many years there was a well-known trading station on the island.

Santa Catalina lies about 2 miles south of Santa Ana. It is of similar structure but about half the size. The island is thickly wooded and surrounded by a fringing reef, which makes landing difficult. Anchorage for small vessels is said to be available off the northern reef, close to the only village. The people have a culture similar to that of Santa Ana.

RENNELL AND BELLONA

Rennell and Bellona are two limestone islands lying about 100 miles to the south of Guadalcanal. They are both populated by Polynesians and visits by Europeans are strictly controlled by the government.

Rennell (Fig. 225) appears to have been discovered by Captain Butler in the *Walpole* in 1801. All dimensions, and even the outline of the coast, are uncertain, since no thorough survey has been made. Estimates of greatest length vary from about 42 to 50 miles; greatest width has been estimated at between 8 and 10 miles. The various sketch surveys that have been made differ widely in respect not only of general proportions but also of local details.

Structurally, the island is a large coral atoll raised some 400-500 ft. above sea level, with resulting precipitous cliffs facing the sea, a high land rim at their summit and a central depression. At its lowest (south-east) end this depression is filled by the freshwater lake Tenggano, the surface of which is 70 ft. above sea level. The surface of the coral limestone has gaping fissures and jagged pinnacles and is covered with dense jungle. The soil occurring in pockets in this surface is

of the red friable type common on such limestone formations (vol. II, p. 542). The few native tracks which pass through gaps in the cliff ramparts and into the interior are the only practicable means of communication across the island. All rain quickly sinks into the ground, but numerous springs of fresh water issue at or below sea level.

From the sea the limestone cliffs present a level uniform profile. The shore, with occasional white sandy beaches, is protected by a barrier reef covering much of its length, making boat landings impossible along such sections. The only major indentation in the coast is Kunggava bay, nearly midway along the south-west coast, and affording anchorage in 8 fathoms in a bight in the fringing reef; this anchorage is sheltered in south-easterly winds but unsafe in south-westerlies.

The population was estimated in 1930 at between 1,200 and 1,500. The people are Polynesians; but their frizzly hair and certain other physical characteristics show some admixture of Melanesian blood. The only permanent centre of settle-



Fig. 225. Rennell

Rennell is wholly unsurveyed. Scale, position, coastline, etc., shown on this map are only approximate. Based on: (1) sketch-map by Northcote Deck in *Geographical Journal*, vol. LVII, p. 474 (London, 1921); (2) various official sources.

ment on the coast is at Kunggava bay; other centres are concentrated round the shores of the lake and in the western half of the island. Owing to the lack of contact with Europeans the people retain their ancient culture almost unchanged. They live in houses 20 to 25 ft. long and 12 to 15 ft. wide. They grow yams and taro in small clearings and collect shellfish, nuts and wild fruits. Their wood carving is of a high standard, but their outrigger canoes used on the lake are said to be of frail construction. The population is divided into five political divisions (tribes), each with a chief supported by supernatural sanctions. The South Seas Evangelical and Seventh Day Adventist missions both have stations on the island.

Bellona, also discovered by Captain Butler, lies about 15 miles to the north-west of Rennell. It is about 6 miles long from north-west to south-east and under 2 miles wide, with a uniform height of about 250 ft. It, too, is presumably a raised atoll. The surface (Plate 93) is of the same formation as that of Rennell, though soil is much more abundant. At north-west and south-east extremities are fairly

sharp promontories, each fringed with coral reef. Three sandy beaches occur on the north-east coast. The natives are the same physical type as those on Rennell, with whom they communicate by canoe, and they possess a similar culture. In 1930 they were reported to number possibly 500.

SANTA CRUZ GROUP AND OUTLYING ISLANDS

The Santa Cruz islands (Fig. 226), lying between lat. 10° and $11^{\circ} 45'$ S and long. $165^{\circ} 40'$ and 167° E, were discovered in 1595 by Mendaña. The group consists of the four main islands of Tinakula, Ndeni (Santa Cruz), Utupua and Vanikoro, and the Reef (Swallow) islands to the north of them. Included in the administrative district of Santa Cruz are other outlying islands—the Taumako (Duff) group, Tikopia, Anuta and Fatutaka. The total population of the district in 1931 was 5,080.

TINAKULA

Tinakula (lat. $10^{\circ} 24'$ S, long. $165^{\circ} 47'$ E) is an active volcano (p. 611) 2,200 ft. high, conical and about a mile in diameter. It is barren near the summit but covered with vegetation round the base. It is uninhabited.

NDENI (SANTA CRUZ)

Ndeni, known locally as Santa Cruz, lies about 18 miles to the south of Tinakula. The island is roughly rectangular in shape with a length from east to west of about 23 miles and a breadth of about 11 miles. On north, east and south densely wooded hills rise from the sea to a maximum elevation of 1,800 ft. Little is known of the interior. The steep and rugged coast has numerous bays. Graciosa bay on the north-west (Plate 126) provides secure anchorage in 8-9 fathoms on good holding ground; on the south-west coast is a large bay between capes Boscawen and Mendaña. Byron and Carlisle bays on the north coast give good shelter in the trade winds. At the entrance to Graciosa bay lies the small island of Te Motu; off the south-east coast is Lord Howe island (one of several so named, pp. 406, 668). The population (which numbered 1,805 in 1931) is concentrated in coastal villages (Plate 127). The interior is uninhabited.

UTUPUA

Utupua (lat. $11^{\circ} 19'$ S, long. $166^{\circ} 31'$ E, approximately) is an almost circular island about 7 miles in diameter. A long inlet, Basilisk harbour, on the south-west coast, almost bisects it. Hills rise to about 1,240 ft. The whole coast is surrounded by a sunken fringing reef of coral over 2 miles wide and unbroken except for Ringdove passage which leads into Basilisk harbour. The shores of the harbour are also fringed with coral, narrowing the entrance channel to 600 yd. At its head the harbour forks into Byron and Sabben bays. The population, which numbered 157 in 1931, lives in five coastal villages.

VANIKORO

Vanikoro is an irregularly shaped island about 20 miles south-east of Utupua. The small island of Tevai lies off the east coast. Both are of volcanic origin, with relatively recent lava flows still visible on the surface. Vanikoro is mountainous and rises to 3,631 ft. at mount Popogia (Kapogo); there are several lesser peaks. Tevai is a single peak. Both islands are densely wooded. Their coasts are almost entirely

fringed with reef, making landing difficult. The most used anchorage is at Peu, where the government station for the Santa Cruz District and the headquarters



Fig. 226. Santa Cruz group and neighbouring islands

The population of some of the villages shown is very small. Based on: (1) Admiralty chart no. 17; (2) British Solomon Islands Protectorate Lands Department map of the Santa Cruz District, 1938; (3) *Report of the 1931 Census* (unpublished, Tulagi, 1931).

of the Vanikoro Kauri Timber Company are situated; but there are several other suitable anchorage-areas, especially round the shores of Manevai bay. In 1931 the population of Vanikoro and Tevai was 60.

REEF ISLANDS

This group, known also as the Swallow islands, comprises about a dozen small islands, probably fragments of a raised atoll. Spread in a wide arc about 45 miles long, they total 50 sq. miles in area and are mostly surrounded by fringing reefs. The largest, Lomlom (Fonofono), lies at the south-east end of the arc. It is about 200 ft. high and 6 miles from east to west. Stretching in a chain north-westward of Lomlom are Fenualoa, Nufiloli, Pileni, Nukapu, Nalogo, and Nupani, while to the west of Lomlom is Matema. The population, totalling 1,438 in 1931, is mainly concentrated on Lomlom. The people are of mixed Melanesian and Polynesian physical type and culture, but the languages spoken on most of the islands (p. 632) are mainly Polynesian.

TAUMAKO (DUFF) GROUP

The Taumako group (lat. $9^{\circ} 57' 5''$ S, long. $167^{\circ} 13' E$, at Taumako island) consists of five small islands and several rocks. The name Taumako, recorded by Quiros as that of the principal island, is now commonly extended to apply to the whole group; but the islands have also acquired the names of Duff group and Wilson group as a result of their rediscovery by Wilson of the mission ship *Duff* in 1797. Apart from Taumako, the main islands are Treasurers island and Obelisk. They are of volcanic formation and rugged outline, and are lightly wooded. Swarms of mosquitoes make living conditions difficult. The people, apparently Polynesian, all live on an islet on the reef of Taumako island. They are noted for the large canoes which they build and exchange with the inhabitants of neighbouring islands. The population was 143 in 1931.

TIKOPIA (Fig. 227)

Tikopia (lat. $12^{\circ} 18' S$; long. $168^{\circ} 48' E$) was discovered by Quiros in 1606, and received some notice through Dillon's discovery of relics of La Pérouse's expedition there in 1826.

The island is approximately oval in shape, about 3 miles long by 2 miles in greatest width. It is of volcanic formation, with the south-east side of the wall of the extinct crater partly breached, possibly by secondary explosion. The crater rim attains a maximum height of 1,235 ft. on the north side, at the peak of Reani. From Reani long slopes trend down to the rugged north coast of the island, but on the south side of the peak cliffs fall steeply away to a large lake. The ridge of hills continuing from Reani encircles this lake, which occupies the site of the ancient crater; the lake water, though fresh, is murky and is not drinkable, though the people use it for washing. (Drinking water is obtained from springs carried down from the hillside by flumes of areca palm trunk.) The south-west side of the island is a plain of sandy detritus and contains a swampy area in which much pandanus grows. The coast is surrounded by fringing reef (Plate 121), usually 100 yd. or so wide except on the north, where it narrows to a mere bench and is occasionally absent. There are long sandy beaches especially on the north-western and south-eastern sides, but on the north side the beaches are few, small and pebbly. Anchorage is obtainable in the north-west side, at Ringdove anchorage, in 27 fathoms, off a prominent bluff; and a little to the south there is a narrow fissure in the reef used by the natives as a canoe passage through which landing may be made. There is a similar passage on the south-east side. Both are dangerous in rough weather. In fine weather landing may be made on the reef, which dries at low water except perhaps on the north side, where there appears to be nearly always a swell.

lineal kinsfolk) has several, scattered throughout the island. Taro, yam, breadfruit, coconut, banana, sago and fish are the main foods, and the chief occupations of the people are agriculture and fishing, for the latter of which they use stoutly built outrigger canoes.

ANUTA

Anuta, often known also as Cherry island, lies about 70 miles eastward of Tikopia. Of oval shape, it is about $\frac{1}{2}$ mile long from north to south and rises to a twin hill in the centre with the northern peak 212 ft. high. A fringing reef, drying at low water, encircles the coast, making landing difficult except for canoes. The Polynesian people, related to those of Tikopia, with which there was formerly intercourse by canoe, numbered 84 in 1931.

FATUTAKA

Fatutaka (lat. $11^{\circ} 55' S$, long. $170^{\circ} 12' E$) lies about 26 miles south-eastward of Anuta. It is steep and rocky, and consists of two small hills which give it the appearance of a mitre (hence the name of Mitre island by which it is sometimes shown on charts). It is uninhabited, though occasionally visited by people from Anuta for the sea birds which nest there.

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(For Maps see Appendix I.)

Appendix I

MAPS AND CHARTS OF THE WESTERN PACIFIC (TONGA TO THE SOLOMON ISLANDS)

GENERAL

There are relatively few detailed topographical maps of islands within the area covered by this volume of the Handbook. Apart from maps produced by lands and survey departments for certain islands, charts and sketch maps published in various journals provide the bulk of the cartographical material available. Recent air surveys in connection with military operations in the region have considerably increased geographical knowledge, but their results are obtainable as yet only through official channels.

Charts

Most charts are produced on Mercator's projection. In charts dealing with individual islands or with anchorages scales vary from about 1 : 5,000 to 1 : 200,000; charts of groups are generally on a smaller scale. The principal bodies issuing charts for the area under consideration are the Hydrographic Department of the Admiralty, the United States Navy Department Hydrographic Office, and the French 'Service Hydrographique de la Marine'. Index sheets will be found in the various *Sailing Directions*; and details of the charts of each issuing body are contained respectively in the *Catalogue of Admiralty Charts and Other Hydrographic Publications*, the *General Catalog of Mariners' and Aviators' Charts and Books* (issued by the U.S.H.O.), and the *Catalogue des cartes, plans et ouvrages, qui composent l'hydrographie française*. There are also German charts for some areas.

In the following detailed notes dates of the original surveys have been given; the dates of new editions of charts and of large corrections are obtainable from the catalogues cited above.

Being primarily concerned with the delineation of coasts, charts often show little detail in the interior of large islands.

G.S.G.S. Maps

Only a few areas are at present covered by maps produced by the Geographical Section of the General Staff. Several maps have been issued of Fiji, also maps of the New Hebrides, Norfolk island, and the Kermadec islands.

Other Official Maps

The American Army Map Service (A.M.S.) has produced maps of Fiji and New Caledonia; also a series entitled 'Melanesia', on a scale of 1 : 500,000, covering the Solomon islands and the New Hebrides. The A.M.S. 1 : 1,000,000 Aeronautical Chart Series, on a Lambert Conformal Conic Projection, covers the Western Pacific; it provides a certain amount of topographical information and also the position of radio stations.

The French, Australian and New Zealand governments have produced maps of the areas under their administration. The Fiji Lands and Survey Department and the British Solomon Islands Protectorate Lands Department have produced maps of their respective areas. These are listed below in the notes on individual groups.

Miscellaneous Maps

Many sketch maps, generally on a small scale, have been published in scientific and other periodicals and monographs. These generally rely for coastal features on charts, but frequently give new topographical information on inland regions, besides specialized data on subjects such as geology, population distribution, location of settlements, and place-names.

TONGA

British, United States and French charts of Tonga are nearly all based on surveys by H.M.S. *Egeria* and *Penguin* between 1888 and 1898. The principal exception is the French chart of the whole group, which is based on a survey by Captain Vincendon-Dumoulin in 1849.

Excluding those on a small scale showing the relation of Tonga to neighbouring groups, British charts of Tonga comprise: a chart of the whole group (1 : 580,000); the Vava'u group, the northern Ha'apai group, the southern Ha'apai group, and the Nomuka group (4 charts, each 1 : 72,600); and a number of charts on larger scales. These latter include: Tongatapu, Lifuka, Neiafu harbour, Ofolanga, the waters round Fonuafo'ou (Falcon island), Niuafo'ou, and Niuatoputapu (the last two based on Tongan government surveys of 1928 and 1930).

The A.M.S. has produced maps of: Tongatapu (1 : 31,680), based on a plan of 1910; Tongatapu and 'Eua (1 : 125,000), based principally on charts; and of the Niuatoputapu group, based on Tongan government surveys. There are useful sketch maps in: E. W. Gifford, *Bernice P. Bishop Museum Bulletin*, no. 61 (Honolulu, 1929); J. E. Hoffmeister, *Bernice P. Bishop Museum Bulletin*, no. 96 (Honolulu, 1932); and A. H. Wood, *A History and Geography of Tonga* (Nuku'alofa, 1932).

Fiji

British, American and French charts of Fiji are all based on British surveys. Some are based on surveys by H.M.S. *Herald*, Captain H. M. Denham, in 1854-6, the majority on surveys by H.M.S. *Alacrity*, *Renard* and *Waterwitch* between 1876 and 1896, and a few on surveys since 1900. For some areas use has been made of the surveys of the local Lands and Survey Department.

Admiralty Charts. There is an Admiralty chart of the group on a scale of 1 : 726,000; the southernmost islands are shown in an inset on a scale of 1 : 1,400,000. Viti Levu and its off-lying islands are covered by four charts (approximately 1 : 145,000). Topographical detail for the interior is scanty and is at some points at variance with that shown on Lands and Survey Department maps. There are separate charts for Suva (1 : 12,100) and Lautoka (1 : 7,500) harbours. Other charts include: Ovalau and Moturiki (1 : 24,200); Levuka harbour, in Ovalau (1 : 14,000); Nairai and Mbatiki (1 : 36,300); Ngau (1 : 36,300); Kandavu (1 : 142,000); Vanua Levu and Taveuni (covered by several sheets, on various scales); Mosala (1 : 36,300); Totoya (1 : 24,200); Matuku (1 : 24,200); and various other islands of the Lau group. There are also plans of many of the more important anchorages and passes.

Lands and Survey Department Maps. The Fiji Lands and Survey Department has produced many maps, but survey work, except in the more closely settled areas, is still in an early stage. The most useful maps are: the colony on Cassini's projection, produced in 1938, showing the main islands on a scale of 1 : 500,000, with insets of the Lau group (1 : 1,000,000) and Rotuma (1 : 500,000); the lower Rewa (1 : 63,360) and Suva (1 : 12,672), produced in 1934; and Viti Levu (1 : 190,080), with insets of Suva, Lautoka, Mba, Nandi, Singatoka, and Levuka

(1 : 62,360), produced in 1939. These maps all show relief by hachuring; they show settlements, government stations, land communications, etc.

G.S.G.S. has reprinted several of the Lands and Survey Department maps. A.M.S. has produced a map of Fiji (1 : 250,000), in seven sheets, on a polyconic projection; these are based principally on Lands and Survey Department maps and on U.S.H.O. charts. A.M.S. has also produced a map of the Yasawa group (1 : 63,360) in two sheets.

ROTUMA, UVEA (WALLIS ISLAND), FUTUNA AND ALOFI (HOORN ISLANDS)

British, American and French charts of Rotuma are all based on British surveys; the British charts both of Uvea and of Futuna and Alofi are based on French surveys. The Admiralty chart of Rotuma is on a scale of 1 : 72,600; that of Uvea 1 : 127,350 (with Mua and Matautu anchorages 1 : 24,860); and that of Futuna and Alofi 1 : 177,390 (with Singave bay 1 : 22,130).

GILBERT ISLANDS

The Gilbert islands were first surveyed by the United States Exploring Expedition, under Captain Wilkes, in 1841. The expedition's work has since been supplemented by that of British naval officers, of local government officials, and of the masters of mission and other vessels visiting the islands. British and American charts are in nearly all instances based on the same sources. The Admiralty chart of the group is on a scale of 1 : 780,000; the U.S.H.O. chart, which is coloured, is on a scale of 1 : 973,911. Charts of individual islands are on scales of about 1 : 130,000 to 1 : 200,000. There are Admiralty charts of all the islands of the group. Plans of anchorages, etc., on a larger scale, in the Admiralty series, include: the main entrance to the lagoon, Butaritari (Makin), based on a survey by Captain G. H. Heyen in 1934; Betio anchorage, Tarawa; the south side of Nonouti; Peacock anchorage, Tabiteuea; and Espiègle anchorage, Beru.

ELLICE ISLANDS

The Ellice islands, like the Gilbert islands, were first surveyed by the United States Exploring Expedition. Later work has been done mainly by British naval officers; a little has been done by local government officials and by the masters of trading vessels. British and American charts use the same sources. There is a British chart of the Ellice islands, together with the Phoenix group (vol. II, p. 494), and a separate chart of the southern part of the Ellice islands alone. There are larger scale Admiralty charts of all the individual islands of the group.

OCEAN ISLAND

British and American charts of Ocean island (Banaba) are both based on a survey by F. Danvers Power in 1909. The British chart is on a scale of 1 : 48,370. A map of the island was compiled in 1927 by the Fiji Lands and Survey Department, showing settlements and communications, on a scale of 1 : 4,752; it has not been published. A sketch map is included in A. F. Ellis, *Ocean Island and Nauru* (Sydney, 2nd ed., 1936).

NAURU

The Admiralty chart of Nauru is on a scale of 1 : 75,000. It is based on an Australian government plan and shows form lines, spot heights, and roads and tracks.

A more recent map, on a larger scale, has been compiled by the Property and Survey Branch of the Department of the Interior of the Australian Commonwealth Government. This was published with the *Report to the Council of the League of Nations on the Administration of Nauru during the Year 1939* (Canberra, 1940). It is on a scale of 1 : 15,840 and shows land-holdings, roads, tramways, coral rocks, etc. Maps showing relief in colour are contained in: C. Elschner, *Corallogene Phosphat-Inseln Austral-Oceaniens und ihre Produkte* (Lübeck, 1913); P. Hambruch, *Ergebnisse der Südsee-Expedition, 1908-10, II. Ethnographie, B. Mikronesien, Band I* (Hamburg, 1914), on a scale of 1 : 15,000; and W. Bohne in *Petermanns Mitteilungen* . . . , 72 Jahrgang (Gotha, 1926).

KERMADEC ISLANDS

British and foreign charts of the Kermadec islands are all based on the survey by Captain H. M. Denham, H.M.S. *Herald*, in 1854. The Admiralty chart shows Raoul (Sunday) island on a scale of 1 : 24,200, and Macauley, Curtis and Cheeseman islands on a scale of 1 : 36,300. The New Zealand Lands and Survey Department published a map of the group in 1887, which was reprinted in 1898 and copied by G.S.G.S. in 1942. This is based on the Admiralty chart and on surveys by S. Percy Smith and H. D. M. Haszard, officers of the department. It shows Raoul island on a scale of 1 : 31,680. Raoul island has recently been surveyed again, in connection with the establishment of a radio-meteorological station (p. 392), but the results of the survey have not yet been published.

NORFOLK ISLAND AND LORD HOWE ISLAND

The Admiralty charts of both Norfolk and Lord Howe are based on surveys by Captain H. M. Denham, H.M.S. *Herald*, in 1855. The chart of Norfolk shows the island on a scale of 1 : 30,000, with an inset on a larger scale of Sydney bay. (The inset gives an out-of-date plan of the town of Kingston.) The chart of Lord Howe shows Lord Howe island and Ball's pyramid on a scale of 1 : 97,000; Lord Howe only, 1 : 24,200; Ball's pyramid, 1 : 24,200; and South entrance, 1 : 12,100.

A New South Wales government map of Norfolk island on a scale of 4 in. to the mile, showing roads, settlements, land grants, etc., published in 1904, was reprinted by G.S.G.S. in 1942.

NEW CALEDONIA

Charts. British, American and French charts of New Caledonia are all based on French surveys. Survey work was carried out in most areas between 1856 and 1901; but more detailed study of anchorage areas and of off-lying islands has been continued in more recent years. In general, French charts are on a larger scale than either British or American; and the French series includes a greater number of anchorage plans. There is a French chart of New Caledonia in one sheet (1 : 609,380) and one in four sheets (on scales of about 1 : 220,000). The Isle of Pines and certain stretches of coast are charted on a scale of 1 : 70,000.

There is a British chart showing New Caledonia in relation to neighbouring groups (1 : 1,600,000). Both the British and American series include a chart of New Caledonia in two sheets (1 : 325,000). The British chart of Noumea is on a scale of 1 : 20,000; and there are large-scale plans of most of the principal anchorage areas. Plans of a number of anchorage areas which have been surveyed only in comparatively recent years are available only in the French series. These include: the neighbourhood of Paagoumène (surveyed in 1937), and Yaté (surveyed in 1926).

Other Maps. A.M.S. has published a map of New Caledonia in eight sheets, on a scale of 1 : 112,500 (with an inset of Noumea on a scale of 1 : 45,000). This is based on a map compiled in 1900 for the Union Agricole Calédonienne, supplemented by more recent sources. Contours are shown at intervals of 100 metres; forests and swamps are indicated by shading; and settlements, aérodomes, railways, roads, horse trails, footpaths, etc., are marked. A one-sheet map, based on the same sources, has also been published by A.M.S., on a scale of 1 : 400,000. The Union Agricole Calédonienne map was also used as source for a French map on a scale of 1 : 300,000, showing relief by hachuring; this was originally published in 1903 and has gone through several editions. The edition of 1936 was copied in 1942 by G.S.G.S.

A geological map by Louis Pelatan has been published in colour in: (i) *Le Génie Civil*, tome XIX, no. 22 (Paris, 1891), on a scale of approximately 23 miles to the inch; and, with modifications, in (ii) A. Bernard, *L'Archipel de la Nouvelle-Calédonie* (Paris, 1895), on a scale of 1 : 800,000; and (iii) *Geographical Journal*, vol. XLIX (London, 1917). Bernard also publishes in colour a topographical map on a scale of 1 : 800,000.

LOYALTY ISLANDS AND WALPOLE ISLAND

British and French charts of these islands are based on French surveys, with the one exception of the British chart of Walpole island, which is based on a survey by Captain H. M. Denham, H.M.S. *Herald*, 1856. The British series includes: Uvea and Beautemps-Beaupré (1 : 144,000); Walpole island (1 : 36,300); and various anchorage plans. The French series contains an additional anchorage plan—that of Beautemps-Beaupré (Heo) island anchorage (1 : 40,000), based on a French naval survey in 1938.

NEW HEBRIDES (INCLUDING BANKS ISLANDS AND TORRES ISLANDS).

Charts. British, American and French charts of the New Hebrides are, in general, based on the same sources. A large part of the group was surveyed by officers of H.M.S. *Dart* between 1890 and 1894. Certain outlying areas were surveyed earlier—the Banks islands (Lieut. A. M. Field, H.M.S. *Dart*, 1886); Futuna (Eronan) (Captain H. M. Denham, H.M.S. *Herald*, 1853); and certain anchorages (mainly by British naval officers). Since the *Dart* survey British naval vessels have continued to undertake a large part of the survey work which has been done. Some important surveys have been carried out, however, by French officers—notably that of the Torres islands by Cosmao-Dumanoir and Picot, in the *Scorff*, in 1893. Masters of trading and mission vessels have also contributed much information regarding many anchorage areas and regarding coasts which have not yet been fully surveyed. The most important unsurveyed areas are: Tana; Eromanga; the west coast of Malekula; the north of Raga; Maewo; and Omba.

Admiralty charts of the New Hebrides include: the New Hebrides shown in relation to neighbouring groups (1 : 1,600,000); Malo to Efate (1 : 290,000); the Banks islands (1 : 220,000); the Torres islands (1 : 143,460); and charts of individual islands and anchorage plans. Malekula, Epi, Ambrim, and Aneityum are shown on a scale of 1 : 72,600; Efate on a scale of 1 : 145,670; and Espiritu Santo on a scale of 1 : 314,000. Plans are available of nearly all important anchorages, including those in islands which have not otherwise been surveyed.

The French chart of Segond and Bruat channels, though based on the British survey, contains certain additional information (mainly relating to the extent of

settlement in the area). The French chart of the Torres islands, which is in colour, is on a larger scale (1 : 77,250) than the British.

Other Maps. A map of the group on a scale of 1 : 1,000,000 was produced by the 'Service Géographique de la Ministère des Colonies' in 1917. This was reprinted on the same scale by G.S.G.S. in 1942. A map of the group, entitled 'Nouvelles Hébrides: Carte comparative des influences françaises et anglaises en 1902', was published with a report of the Governor of New Caledonia in 1903. This is of considerable interest for the study of the history of the group.

The New Hebrides proper (excluding Aneityum) and the Banks and Torres islands are covered by the A.M.S. 1 : 500,000 series of 'Melanesia'.

Sketch maps provide further information on relief, geology, ethnography, etc., for some areas. The most useful are: Efate, by D. Mawson (*Proceedings of the Linnean Society of New South Wales*, vol. XXX, Sydney, 1905-6); three maps of Malekula, by T. Harrison, showing relief by hachuring, rivers, settlements, district names, etc. (*Geographical Journal*, vol. LXXXVIII, London, 1936); a map of Espiritu Santo, by T. Harrison, giving ethnographical details (*Geographical Journal*, vol. LXXXVIII, London, 1936); north-east Espiritu Santo, showing villages, tracks, etc., and west of Espiritu Santo, showing rivers and relief, by J. R. Baker (*Geographical Journal*, vols. LXXIII, LXXXV, London, 1929, 1935); Gaua, by J. R. Baker, showing the position and shape of the crater lake (*Geographical Journal*, vol. LXXIII, London, 1929); and maps in A. B. Deacon, *Malekula* (London, 1936), and J. Layard, *Stone Men of Malekula* (London, 1942).

MATTHEW AND HUNTER ISLANDS

The Admiralty chart of Matthew and Hunter islands is on a scale of 1 : 24,700. It is based on the survey of Captain H. M. Denham, H.M.S. *Herald*, in 1836.

SOLOMON ISLANDS

Charts. The most extensive survey work in the Solomons has been carried out by British vessels—notably H.M.S. *Lark* (1883-4), *Penguin* (1893-5), *Dart* (1902), and *Sealark* (1910-12). Anchorage surveys in Bougainville and Buka were made by a German naval vessel. Many parts of the group, however, have never been fully surveyed. For many outlying areas, notably the Santa Cruz group and neighbouring islands, early sketch surveys are still the only source. These include surveys by D'Entrecasteaux (Ndeni, 1791); Wilson, of the mission ship *Duff* (Taumako, 1797); Dumont d'Urville (Vanikoro, 1828; and various areas, 1838); the master of the mission vessel *Southern Cross* (Reef islands, 1867). The officers of the United States Exploring Expedition also surveyed certain areas. In recent years a considerable amount of survey work has been performed by officers of trading or mission vessels—notably by D. M. Lazarus in Ontong Java. The maps of the Protectorate Lands Department (below) have also been used.

Admiralty charts of the Solomons include one of the whole group (1 : 1,080,500) and a number of individual islands and sub-groups. The latter include: Bougainville strait and the adjacent coasts of Bougainville and Choiseul (1 : 192,000); the New Georgia group, in three sheets (1 : 145,350); Ysabel (1 : 144,400); Guadalcanal, Nggela and part of Malaita (1 : 217,500); San Cristobal (1 : 161,270); Ontong Java (1 : 150,000); Santa Cruz islands (1 : 363,000); and Vanikoro (1 : 46,230). There are a large number of anchorage plans, including many of anchorages in islands which otherwise are unsurveyed.

There is a German chart of Bougainville and Buka.

Other Maps. The British Solomon Islands Protectorate Lands Department published in 1933 and following years a series of maps, on various scales, covering

all the major islands of the protectorate and showing settlements, tracks, some plantations, and a certain amount of topographical information. These have been reproduced on smaller scales by the Australian Mobile Lithographic Section. The government of the Mandated Territory of New Guinea published a map of Bougainville and Buka, showing rivers, villages, roads and tracks, in 1930. This has been reprinted by G.S.G.S. on a scale of 1 : 250,000. The A.M.S. 1 : 500,000 series of 'Melanesia' covers the Solomons.

Sketch maps published in various books and journals provide additional information on various areas. Amongst the most useful are: two maps of Buka on a scale of 1 : 20,000 (one with form lines and village names; the other geological) and one of various parts of Bougainville between Kieta and Empress Augusta bay on a scale of 1 : 50,000, all by Dr. K. Sapper (published in *Mitteilungen aus den Deutschen Schutzgebieten*, Berlin, 1910).

Appendix II

PLACE-NAMES IN THE WESTERN PACIFIC (TONGA TO THE SOLOMON ISLANDS)

Place-names in the Western Pacific area, from Tonga to the Solomon islands, present a number of problems. The variety of languages involved—Polynesian, Micronesian, Melanesian, and several European languages—has complicated the situation. A systematic treatment has been rendered more difficult by certain other factors: the variety of circumstances in which the islands came to be named by Europeans; the different principles adopted in areas under different sovereignty or administration; differences between official usage and local usage, even in one area; and different methods adopted for reducing the names to written form.

General Situation: Native Names and European Names

As a whole, the number of native place-names in use exceeds by far that of European names. The modern tendency has usually been to substitute a native place-name, where it can be ascertained, for a European name, especially since the latter is often one of several alternatives, or has never been consistently in use. Thus generally and officially Nauru has replaced Pleasant island; Ulawa has replaced Contrariété; Ontong Java has replaced Lord Howe; Mota has replaced Sugar Loaf island. To this, however, there are certain exceptions. Banaba, the native name for Ocean island, has not replaced Ocean island for general use. Some other European names with particular historical significance have also been retained. This has been so especially with the names given by the early Spanish and French discoverers in the Solomon islands. A difficulty has occurred here, however, with the spelling of some of these names. Variants such as Santa Isabel, Ysabel; Guadalcanal, Guadalcanar; San Cristobal, San Cristoval have been used, owing to confusion as to what the original Spanish forms were. A special case is that of Espiritu Santo, in the New Hebrides, where an accent is sometimes given to the first *i*, in conformity with modern Spanish usage, though the accent was not used at the time the name was actually applied by Quiros. Again, a number of European names are given in their specific national form in the various official and other national publications. Thus the islands named by Cook New Caledonia and Isle of Pines are known to the French as Nouvelle-Calédonie and Ile des Pins respectively, while conversely the island named by Bougainville Pentecôte has often been named in English either Pentecost or Whitsuntide (its native name, Raga, is also used). Furthermore, in some cases one European name has come to supersede another; thus the islands formerly commonly known as the Kingsmill group are now known officially and generally as the Gilbert islands, and the islands often known as the Swallow islands are now usually termed the Reef islands, in accordance with local usage.

It might seem that the most logical way of meeting the difficulty of these alternative or even conflicting European names would be to adopt the original native name in all cases, as has been done in many. But a special complexity arises from the fact that before the coming of Europeans, and even in some cases at the present day, in certain of the larger islands there was no native name for the island as a whole. Some native names which have been applied to such islands have in fact been the names of only certain districts or other portions of them. Bugotu, for instance, which locally in the Solomon islands is commonly used to refer to Ysabel,

is properly speaking only the name of the south-eastern part of the island. Mota Lava (Motlav), generally used for what has been known also as Saddle island, refers strictly to the south-western end only. Again, the island in the Solomons named Narovo on Admiralty charts is commonly known locally as Simba, but it has also been called Eddystone, though this name was originally given to a rock off the south-west end of the island. In fact the island as a whole consists of two portions linked only by a reef; the smaller portion bears the native name Simbo, while the larger portion consists of three districts, each with its own name, Narovo being that of the northernmost district. If this case not only are both native names in frequent use for the island incorrect in so far as they are applied to it as a whole, but there is a native name, Mandegusu (meaning 'the four districts') which does refer to it. A misconception of another kind in regard to native names has arisen where the name has been taken not from the native inhabitants themselves but from people of another locality. This seems to have occurred in the case of Malaita, which on the authority of the early Spanish voyagers has become current as the 'native' name for the island. In fact the native name is Mala or Mwala, and the Spanish form is probably due to a combination of it with the Bugotu adjective (*feta*, meaning 'up' or 'to the east'). Similarly the name Fiji is apparently due to a Tongan rendering of the native form Viti (which appears in the island name Viti Levu, meaning 'Great Viti'). The island of Tana, in the New Hebrides, is so known from the name given to Captain Cook by the natives of the neighbouring island of Eromanga; it is known to its inhabitants as Ipari.

Terms for Geographical Features

In general the practice adopted for terms referring to geographical features has been to give these in the national form of the country or administration producing the maps or other publications. Thus the French *Presqu'île Ducos* is rendered in English as Ducos peninsula, and so on. Difficulties occur, however, in some cases where geographical terms are used with native names, since the latter have already often incorporated such a term, and the meaning is thus reduplicated. Instances of this have already been given for Polynesian names in the Eastern Pacific (vol. II, p. 687). Recent British and American official practice has been to avoid pleonasm, either by using only the native geographical term or by translating it (e.g., by using *Ava Lahi*, or *Lahi passage*). A special situation has occurred on some maps of Fiji, where English names have been provided with geographical terms in Fijian, to conform to the general policy in the case of native Fijian names. Thus the bay at the head of which the settlement of Richmond is situated has been named on charts 'Tomba ni Richmondi' in conformity with *Tomba ni Koro Levu*, etc.

Orthography and Spelling of Native Names

Difficulties in the writing and spelling of native names in the area from Tonga to the Solomon islands are of similar kind to those described for the Eastern Pacific (vol. II, pp. 688-90). The situation in each major island group has already been discussed in its special context in this volume (pp. 54-5, 149, 539-42, 634), so that little needs to be added here. In recent years the orthographical situation has been clarified by official action in regard to a number of islands or groups—for instance, Tonga, Nauru, the Gilbert islands and the Ellice islands. In Fiji one system is retained in missionary publications and for some official purposes, while another phonetic system is used on official maps. In New Caledonia, French phonetic usage has been generally followed in writing native names; this includes the use of accents.

In spelling, variant forms of many place-names have been given. These have been due largely to imperfect appreciation of the native pronunciation by different

recorders, but in some cases to recording of the name from different native sources. Examples of the first are Nukunau and Nikunau; Nonuti, Nanuti and Nonouti; Niurakita, Nukulakita and Niulakita—the last name in each case being now the accepted form. An example of the second is Norbarbar, apparently the local pronunciation of the island generally known as Ureparapara, from the Mota form of the word. Considerable variation often occurs between the French and the English spelling of native place-names, due partly to different conceptions as to how the name is pronounced, but largely to the different orthography employed. In the New Hebrides, for instance, the English forms Efate, Aneityum and Malekula correspond to the French *Vaté*, *Aneytioum* (or *Anatom*) and *Malekoula* (or *Mallicolo*). For New Caledonia, a few forms of place-names have become conventionalized in English usage, as *Nouméa* (omitting the French accent on the *e*), but some other Anglicized forms proposed by the P.C.G.N.—as *Tyo* for *Thio*; *Dotyo* for *Dothio*; *Wailu* for *Houailou*; *Ubach* for *Oubatche*—have not been generally adopted, although used for a time on Admiralty charts and in the *Pacific Islands Pilot*. For a number of minor place-names in New Caledonia and the Loyalty islands the French spelling has not been completely uniform, especially in the use or omission of accents.

A special problem of spelling occurs in regard to the uniting or dividing of words or syllables which form part of a place-name, and to the use of hyphens. The general modern tendency is to avoid the use of hyphens, and to run the different parts of the place-name together to form a single word. But no consistent system has been adopted, nor in the face of variant local usage does such a system appear feasible. A similar problem occurs in regard to the particles often used before nouns to specify the object or indicate definiteness. In Fijian place-names such a particle is sometimes prefixed to the noun as part of the name, and sometimes not; no general rule has been adopted, even in official publications.

Conclusion

The lack of uniformity in place-name forms in the Western Pacific at the present time renders it impossible to adopt any wholly consistent treatment in this volume. In general, official usage has been followed, with spellings based where possible on the *General Lists of Oceanic Names* given by the Permanent Committee on Geographical Names. The main principles adopted have been summarized on pp. 12-3.

Appendix III

THE WESTERN PACIFIC ISLANDS (TONGA TO THE SOLOMON ISLANDS), 1939-44

This volume is concerned with general conditions in the Western Pacific islands, and necessarily is based mainly on material referring to the period before the present war, though incidental reference has been made to conditions since 1939. The purpose of this appendix is to give a brief review of the situation, particularly in its political and economic aspects, after the outbreak of war. The war has affected all the islands and groups described in this volume, owing to their dependence on external markets and to their political ties with European countries. Since December 1941 a number of the islands have undergone occupation by the Japanese, though by June 1944 all of them, with the exception of Nauru, Ocean island and parts of Bougainville, had been recaptured by United States, New Zealand or local forces.

Political Conditions

No major changes took place in the southern and south-western part of the Pacific during the first months of war. As in the Eastern Pacific, the British and French colonies strongly supported the war effort. Natives and Europeans alike contributed towards the cost of the war, mainly by gifts of money. Among British territories, for example, by February 1943 Fiji had subscribed the cost of two bombers and five fighter aircraft, and had also contributed between £30,000 and £40,000 to various war funds. Tonga had subscribed the cost of one fighter aircraft, as well as between £5,000 and £6,000 to the British Red Cross, and was contributing £20,000 a year from the revenues of the kingdom. The native people of Ocean island, numbering about 1,750, announced their intention at the outbreak of war of giving £10,000 (Australian) to British war funds. When the British authorities at Suva deprecated this, as being too large a sum, they increased it to the same amount in sterling—about 25 per cent. more. Many Europeans and natives also enlisted in the fighting services. In the Solomon islands campaign, for instance, a mixed force of Fijians and Tongans, combined with New Zealanders and local British residents, distinguished itself on patrols and scouting expeditions.

The fall of France altered the status of the French possessions in the Western Pacific. The people of New Caledonia, with the exception of a few officials, were almost unanimously in favour of continuing the war under the leadership of General de Gaulle. However, the Governor, M. Pellicier, while apparently sharing the popular view, was secretly in touch with Vichy. On his recall by Marshal Pétain, as the result of a demand from the local general council, he was succeeded by Colonel Denis (the commandant of the New Caledonia troops), who was an open supporter of Vichy. At the request of General de Gaulle, M. Henri Sautot, the French Resident Commissioner in the New Hebrides, arrived in Noumea on 19 September 1940 and received an enthusiastic reception. In the face of this opposition Colonel Denis resigned, and was replaced by M. Sautot. In November 1941 Captain (now Admiral) Thierry d'Argenlieu, who had been appointed Free French High Commissioner for the Pacific by General de Gaulle, arrived in Noumea; he later removed M. Sautot and assumed charge of the colony. Most of the French residents in the New Hebrides were from the first adherents of General de Gaulle, but those in Uvea (Wallis island) and Futuna actively assisted the Vichy regime until the end of 1942, when they yielded to a Free French warship sent from New Caledonia.

Since coming formally under the Free French (later Fighting French) regime,

the French possessions in the Western Pacific have made substantial contributions to the war effort. Considerable sums have been subscribed in New Caledonia (and in the New Hebrides) to war funds, and volunteers have been provided for the French fighting services overseas, as well as for a home guard and a body of native troops to help in the defence of New Caledonia. After the Japanese threat to the south Pacific islands and to Australia and New Zealand developed, New Caledonia became a base for Australian, then United States, and later New Zealand forces.

The Japanese advance into the Gilbert islands and the Solomon islands put an end to normal administration there. The European population was largely evacuated from the Gilbert islands, but a number perished there, and the Europeans on Ocean island and Nauru were taken prisoner. The natives appear to have been indifferent or hostile to Japanese propaganda, and in the Gilbert islands they later proved friendly to Allied forces. In the British Solomon Islands Protectorate, the Resident Commissioner and a skeleton administrative staff, as also the Bishop of Melanesia and some of the other European missionaries, stayed on in the islands, avoiding the Japanese by withdrawing into the interior when necessary. With the co-operation of natives, who acted as scouts, they reported to military headquarters the movements of the enemy. Now that the Japanese have been driven from the Gilbert islands and from practically all parts of the Solomon islands, active reconstruction work is in progress.

Economic Conditions

The economic effects of the war have been felt throughout the Western Pacific from 1939 onwards; from December 1941 those islands which became a theatre of war have naturally had their whole economy disrupted.

After the outbreak of war agricultural producers suffered by the closing of the German market for copra and the general restriction of demand in Europe for this product. This market disturbance and the shortage of shipping led to the accumulation of large stocks of copra in the warehouses of Suva, Nuku'alofa, Tulagi and other islands ports. In the Solomon islands, by June 1940 lack of shipping and low prices had brought recruiting of native labourers and copra-buying by the traders to a standstill. In New Caledonia a coconut oil factory was set up to deal with the copra glut. For British territories as a whole a remedy was sought early in 1941. To facilitate shipping and marketing the United Kingdom, New Zealand and Australia agreed to pool the copra output of all the Pacific territories under their control. Each territory was allotted a quota based on a ratio of anticipated sales to normal production. Discussion also took place with the Free French authorities to bring copra from the French possessions into the scheme. Some progress had been made, and producers had been encouraged by fairly firm general prices for copra, with a slightly rising tendency, when the entry of Japan into the war dislocated all plans for the time. More recently, the improvement in general conditions has led to a more favourable market situation. Whereas in November 1941 the price of copra in Suva was £5 10s. per ton for sun-dried grade and £6 10s. for plantation grade, in June 1944 the price was in the vicinity of £18 per ton. But a new difficulty has now arisen—a shortage of labour to work the plantations and to cut the copra. Recently numbers of native Fijians released by the cessation of urgent war work have been encouraged to undertake plantation work.

Other forms of agriculture were similarly affected by the war. In August 1941 it was estimated that only two-thirds of the annual Fiji sugar crop could be exported, owing largely to shipping difficulties. For the French coffee growers in New Caledonia and the coffee and cocoa growers in the New Hebrides, the fall of France closed the accustomed markets. Australia came to the assistance of New Caledonia by lowering the tariff on coffee and agreeing to take the whole output, while Britain similarly assisted the growers in the New Hebrides by taking their coffee at a

guaranteed price. An outlet for the meat industry in New Caledonia, which had also suffered, was found in supplying the needs of the Fighting French forces.

On the whole, other types of production have perhaps suffered less than agriculture, though the phosphate industry of Nauru and Ocean island has been temporarily lost. Exports of phosphate from Nauru were interrupted by the shelling of the loading plant by a German raider in December 1940, and production at Ocean island was increased to offset this as far as possible, but this in turn ceased to be available on the entry of the Japanese into the war. Gold production in Fiji has been rising steadily, and in the Solomon islands the new goldfield on Guadalcanal was giving a promising yield until the Japanese invasion interrupted work. In New Caledonia, after the outbreak of war with Germany, the Japanese increased their interest in nickel and developed the iron ore industry, but nickel stocks as a whole were accumulating until September 1940, when an agreement was reached whereby Australia took the nickel in exchange for various commodities essential to New Caledonia. The chrome export of New Caledonia has similarly been absorbed by the United States, especially since the loss of the Philippines. It appears that now both nickel and chrome mines are working almost to capacity. Timber from New Caledonia is also being taken in quantity by Australia.

In addition to the problems of finding shipping and markets for their products, the island territories have experienced shortages of consumers' goods, often acutely. This has been due mainly to restrictions on imports through lack of shipping, and to the general lack of civilian supplies for export from the manufacturing countries. In consequence, rationing of certain foods, and of petrol, has been imposed in some territories; in Fiji the prices of some essential goods have been controlled. Goods such as cloth, tinned foods and kerosine have tended to become very scarce, and most manufactured commodities have been in short supply. As a result, economic policy in the various territories has led to the attempt to achieve as great a degree of local self-sufficiency as possible. For example, in Fiji the local growing of some foodstuffs hitherto imported has been encouraged, and to meet a serious shortage of building materials the timber industry has been rapidly developed. In New Caledonia, where in 1941 there was an acute shortage of shoe-leather, plans were made to tan locally the large number of deer-skins which were formerly exported as raw hides to Australia.

Other economic problems have also arisen in certain territories. For instance, Fiji has experienced a currency shortage, despite a greatly increased issue of coinage since 1939, and the printing by the government of 2s. and 1s. notes in addition to the ordinary denominations, including 5s. The demand for coinage is to some extent due to the use of it by jewellers in making souvenirs for visiting troops, but the general reason for the shortage has not been entirely clear. To meet the situation, banks rationed the issue of silver coin, postage stamps were often used by traders instead of pennies, and some commercial firms even printed 1d. tokens for use in their stores.

One effect of the war has been a considerable increase of road construction in a number of territories to serve the needs of military transport, and the establishment of a number of airfields. Both these developments will almost certainly facilitate communication and transport in the region after the war. To some extent associated with the war (which has produced a strengthened interest in colonial problems), but also resulting from proposals put forward independently, there has been a general movement towards an extension and a reorganization of the social and economic services of these Pacific island territories. A beginning has already been made, for instance, in a new campaign in the south-west Pacific against the *Anopheles* mosquito; in a grant, under the Colonial Development and Welfare Act, 1940, for a tuberculosis survey in Fiji; and in schemes to stimulate the native peoples to grow more foodstuffs and dispose of them through co-operative marketing associations.

INDEX

- A'a, 23
 Abaiang, 307, 344, 346, 363, 369 (fig.); description, 372
 Abemama, 305, 307, 318, 369 (fig.); description, 374-5
 Abnetare, 585
 Achimota College, 192
 Adam, Port, 686
 Administration, 711
Administration des Affaires Indigènes, 459
 Admiralty islands, 5
 Admiralty islets (Lord Howe), 408
 Aesi, 582
 Agricultural education, 77, 178, 474
 Agriculture, 6; Fiji, 158-9, 195-206 (with figs.); Futuna (Hoorn), 299-300; Gilbert and Ellice is., 336, 348-50; Lord Howe, 411-2; Nauru, 349; New Caledonia, 454, 473-80; New Hebrides, 544, 560-1, 563-6; Norfolk, 404; Rotuma, 276; Solomon is., 639, 656-8; Tonga, 62, 78-82; Uvea (Wallis), 286
 Ahanga passage, 105
 Ahau, 29, 110
 Aio harbour, 686
 Air communications, 2, 229, 363, 392, 495
 Air facilities, 2, 572
 Alacrity bay, 256
 Albatross, 390
 Albatross bay, 680
Alemène, French warship, 444
 Alefa, 22
 'Alele'uta, 112
 Alexander, cape, 674
 Algeria, 486
 Aliti, 691
 Alite, 686
 Alo district, 299
 Alofi, 291-4, 296
 Alofitai (Mua), 292
 Alu, 663
 Alvarado, explorer, 316
 Amalgamated Wireless (Australasia), 666
 Amargura, *see* Fonualei
 Ambrim, 514, 516, 517, 519, 525, 531, 537, 553, 559, 577; description, 589-90 (with fig.)
 Amélie, Queen, 286, 288
 American Civil War, 531
 American passage, 261
 Amok (Malekula), 581
 Ana Aha (the Smoky Hole), 95
 Anchorages, Banks is., 594-7 *passim*; Fiji, 119, 212, 218, 220, 239-51 *passim*, 257-64 *passim*; Futuna (Hoorn), 292; Gilbert and Ellice is., 306-7, 370-83 *passim*; Kermadec is., 393-4; Lord Howe, 408; Loyalty is., 498-503; New Caledonia, 432-4; New Hebrides, 518-9, 570-82 *passim*; Norfolk, 396; Rotuma, 268; Solomon is., 613, 667-97; Tonga, 31, 88-111 *passim*; Torres is., 598-9; Uvea (Wallis), 278-9
 Aneityum, 519, 524, 527, 528, 529, 532, 536, 537, 539, 566; description, 600-1 (with fig.)
 Anelgauhat, 566, 601
 Anemata, 302
 Anemata passage, 502
 Angaha, 31 (plate), 111 (fig.), 112
 Aniwa, 537, 539, 601; description, 603
 Anker, 682
 Annand point, 584
 Ano lagoon, 104
 Anson bay, 396, 403
 Antimony, 463, 464
 Antwerp, 469
 Anuta, 607; description, 697
 Aoba, *see* Omba
 Aola, 689
 Aore, 515, 561, 570, 581; description, 584-5
 Aowawa bay, 689
 Api Fo'ou College, 77
 Arabs, 450
 Aragh-Aragh, *see* Raga
 Araki, 582
 Arama, peak, 426; peninsula, 425
 Aranuka, 374 (fig.); description, 375
 Archer entrance, 375
 Areca palms, 621, 667, 696
 Argo reefs, *see* Mbukatatanoa
 Arijiejen, 330-1
 Arnayon islets, 682
 Arorae, 305, 317, 321; description, 379-80
 Arosi district, 631
 Arrowroot, 158, 270, 280, 286, 293, 298, 314
 Artificial islands, 631, 636, 639 (plate)
 Art island, 425, 433
 Art (Melanesian), 5; New Caledonia, 456-8 (with figs.); New Hebrides, 547-50 (figs.), 551-2 (with fig.), 594; Solomon is., 642-3 (with figs.); *see also* Craftwork
 Arubo district, 318

- Arundel, John T. and Co., 351
 Arundel island, 676
 Asano Seiren Kabushiki Kaisha, 463
 Asbestos, 195
 Ashuk head, 578
 Asiatics, 6, 629
 Asie, 673
 Astrolabe bay, 680, 687
 Astrolabe reef (Fiji), 212
 Astrolabe reefs (Loyalty is.), 497, 498
 Astronomy, 328
 'Ata (Pylstaart), 17, 31, 39; description, 95
 Atata, 92
 Atchin, 516
 Atolls, Gilbert and Ellice is., 302-16, 368-83; Fiji, 118, 264; Loyalty is., 302; Solomon is., 667-70, 673
 Auckland, 2, 223, 229, 391, 495
 Aue bay, 433
 Auki, 628, 652, 686 (with plate)
 Aurora, *see* Maewo
 Austral Guano Company, 507, 508, 509
 Australia, 1, 148, 167, 386, 399, 529
 Administration, Lord Howe, 406, 411; Nauru, 393, 352; Norfolk, 394, 402; Solomon is., 650-1
 Communications, 2, 89-90, 233-4, 361, 406, 412, 492, 571-2, 665-6
 Government departments, 402
 Sovereignty, 8, 303, 394, 406
 Trade, Fiji, 134, 208; Gilbert and Ellice is., 357-8; Lord Howe, 411; Nauru, 357; New Caledonia, 465, 473, 478, 481, 485, 486; New Hebrides, 367; Norfolk, 405; Solomon is., 661-2; Tonga, 85; Uvea (Wallis), 290
 Australian Board of Missions, 624
 'Austrialia del Espiritu Santo', 527
 Austria sound, 680
 Ava, 107
 Ava Ahanga Mea, 98, 99
 Ava Fonuaiki, 102
 Ava Fonua Unga, 106
 Ava Houmaulu, 100
 Ava Labi passage, 86, 92
 Ava Lima Moto pass, 87
 Ava Matamata Vika, 98, 99, 102
 Ava Mata Nukupule, 100
 Ava Muikuku channel, 87
 Ava Pulepulekai pass, 88
 Ava Tauofi, 100
 Ava Tupu pass, 87, 88
 Avea, 261
 Avon islet, 509
 Baaba island, 425
 Baanga, 677
 Ba bay, 428
 Bagana, 611, 612, 670
 Bagewa (god of fish), 333
 Bairiki, 372
 Baisen islet, 683
 Bakawari island, 665
 Baker, Shirley Waldemar, 43, 44
 Baker island, 350
 Balabio island, 426, 444
 Balade, 426, 443, 444, 445; reef, 426
 Balbi, mount, 611, 612, 670
 Baldwin cove, 584
 Balesuna river, 688
 Ball, Lieut. Henry Lidgbird, 410
 Ball's pyramid, 409
 Baloka, cape, 682
 Bampton islet, 509
 Banaba, *see* Ocean island
 Bananas, 6, 36, 79, 80, 81 (fig.), 85, 112, 158, 194 (plate), 197, 203-4 (with fig.), 253, 254, 270, 280, 286, 293, 298, 314, 336, 349, 382-3, 402, 404, 405, 473, 498, 524, 531, 544, 565, 621, 639, 658
 Banaré bay, 425, 432
 Banda islet, 509
 Banfield (Vancouver island), 386
 Banika, 682, 683
 Baniu, 672
 Bank of Indo-China, 474, 567-8
 Banks, Sir Joseph, 594
 Banks, Fiji, 211; Gilbert and Ellice is., 358; Nauru, 343; New Caledonia, 460; Norfolk, 406; Tonga, 75
 Banks islands, 511, 517, 521, 525, 526 (with plate), 539, 553, 559; description, 594-7 (with figs.)
 Baptists, 654
 Baranago harbour, 684
 Barbilele, mount, 672
 Barena, 687
 Baretoa, 371
 Bark cloth, 63, 64, 80, 156, 160-1, 263, 298, 696
 Barnett, mount, 683
 Barola, *see* Barora Fa
 Barora Fa, 682
 Barora Ite, 682
 Bagracouta passage, 264
 Barrier bay, 592
 Barter, 4
 Basalt, 67, 118, 573
 Basilisk harbour, 693
 Bataillon, Le Rev. Père, 281
 Bats, 38, 127, 280, 410, 443, 507, 524
 Batuna, 655, 676
 Baye, cape, 428
 Bayonnaise cove, 482
 Bazaars, 164
 Beaches, *see* Coasts
 Beagle island, 688
 Beaufort bay, 689
 Besumont, mount, 682

- Beauteemps-Beaupré, 497; description, 502-3
Bêche-de-mer, 131, 132, 207, 444, 445, 482, 560, 626, 660, 661
 Becke, Louis, 380
 Bees, 349
 Bégat, cape, 430
 Bélep islands, 414, 425, 432, 448, 455
 Belgian Congo, 463
 Belgium, 464, 469, 485
 Bell, Thomas, 391
 Bellingshausen, Vice-Admiral Fabian von, 128, 130
 Bellona, 607, 611, 612 (with plate), 632, 647; description, 691-3 (with fig.)
 Belua, 670, 672
 Benbow, mount, 516, 590
 Berande, bay, 689; river, 688
 Bérard, 445
 Beru, 329, 339, 346, 355, 363, 376 (fig.); description, 378
 Betarara, 592
 Betel pepper, 621
 Betio, 372
 Betséda, 462
 Bibliographical notes, 112-3, 230-2, 301, 383-5, 412-3, 509-10, 604-6, 697-9
 Big bay, *see* St. Philip and St. James bay
 Bikati, 371
 Bike island, 374
 Bikerei, 373
 Biloa, 632, 652
 Bina, 686
 Bingham, Rev. Hiram, 317
 Bingham channel, 372
 Binoinano village, 374
 Bio, 691
 Birds, 38, 127, 280, 315, 390, 393, 399, 410, 443, 507, 525-6, 621
 Birth rate, 146-7 (with fig.), 271
 Bishop, Charles, 316
 Bismarck archipelago, 660
 Bititu, *see* Betio
 'Blackbirding', *see* Labour: Traffic (nineteenth century)
 Black Rock point, 570
 Blackwater fever, 557
 Blanche channel, 676
 Blast furnaces, 482
 Bligh, Captain William, 40, 101, 128, 130, 528, 594
 Bligh island, *see* Ureparapara
 Blinkenthorpe bay, 408
 Blowholes, 23 (plate)
 Boat cove (Kermadec islands), 392
 Boat cove (Torres islands), 598
 Bocège, cape, 428
 Bogacio islet, 584
 Bogota peninsula, 430
 Boisé, Port, 432, 433
 Bokokimbo river, 688
 Bola, cape, 682
 Bombay Presidency, 145
 Boné, 462
 Bonin islands, 2
 Bonito, 316
 Boscawen, cape, 693
 Boscawen island, *see* Tafahi
 Bouabondo peninsula, *see* Arama, peninsula
 Bougainville, Louis Antoine de, 527, 590
 Bougainville island, 8, 607, 611, 613, 618, 626, 630, 635, 636, 638, 644, 645, 651, 652, 655, 666, 676, 690 (plate); description, 670-2 (with fig.)
 Bougainville, mount (Kolofua), 292
 Boulari bay, 421, 422, 492
 Boulinda, 419
 Bouloupari, 495
 Bounty, H.M.S., 103, 270
 Bouquet, Port, 431, 433
 Bourail, bay, 423, 432, 452 (plate), 464; town, 447, 460, 467, 489, 494
 Bower, Lieut., 627
 Breadfruit, 37, 112, 158, 280, 293, 298, 314, 349, 524, 544, 621, 639, 667, 696-7
 Bréneol point, 598
 Brind rock, *see* L'Espérance rock
 Britain, *see* Great Britain
 Britannia, ship (Capt. Butler), 497
 Britannia, transport (Capt. Raven), 396
 British National Court, 555
 British Phosphate Commissioners, 8, 320, 342-3, 345, 358, 360, 361, 362, 363
 Broadcasting, 194, 495
 Bruat, Governor, 281
 Bruat, channel, 584; passage, 664
 Bruce Highway, 362
 Buada, district, 331; lagoon, 315, 355, 366
 Buakonikiai, district, 329; village, 368
 Buariki, 377
Bucephale, French warship, 444
 Bugotu, peninsula, 680; district, 681
 Buka, 8, 609, 610 (fig.), 613, 618, 623, 625, 630, 634, 635, 668, 671 (fig.); description, 669-70
 Buka passage, 652, 670
 Buin district, 632, 638, 666
 Bull passage, 502
 Bungana island, 684
 Buninga, 537, 586
 Buota island, 372
 Buraku, 683
 Burne-Jones, Sir Edward, 401
 Burns, Philp, 210, 214, 225, 290, 358, 361, 363, 383, 406, 412, 532, 571, 572, 662, 663, 665, 685

- Bushman's bay, 571, 577, 580
 Butaritari, 305, 307, 314 (plate), 318, 339, 344, 358, 361, 363, 369 (fig.); description, 370-1 (with fig.)
 Butler, mariner, 497, 691, 692
 Butter, 206
 Byron, Captain Lord, 316
 Byron bay, 693

 Cabbages, 506
 Cables, submarine, 2, 228, 386, 394, 495
 Cableways, 491
 Canada, communications, 2, 223-4; trade, 204, 208
 Canadian-Australasian Line, 223
 Canala, bay, 430, 433, 464; mount, 430; town, 430, 447, 451, 490, 495
 Canberra, 340
 Canneries, meat, 424; pineapple, 204, 252
 Cannibalism, 161, 455, 542, 552, 643
 Canoes, 5; Ellice is., 4, 337-8; Fiji, 156, 159-60, 225; Futuna (Hoon), 298; Gilbert is., 4, 314 (plates), 327-8, 329; Loyalty is., 506; Marshall is., 4; New Caledonia, 455; New Hebrides, 544-5; Rotuma, 274; Solomon is., 631, 638-9 (plates), 641-2, 643, 692, 695; Uvea (Wallis), 287; building, 63, 388
 Canton island, 172, 339
 Cape Marsh, *see* Russell islands
 Captain island, 682
 Carlisle bay, 693
 Caroline islands, 1, 2, 4, 6, 8, 303, 316
 Carpenter, W. R. and Co., 358, 363, 662, 665
 Carteret, Captain Philip, 623, 628, 687
 Carteret islands, *see* Kilinailau islands
 Cascade, bay, 395, 396; landing, 395, 396
 Castor oil plant, 289
 Casuarina, 37, 105, 242, 280, 293, 314, 522, 619
 Catholics, *see* Roman Catholic church and missions
 Cats, 128, 280, 316, 389, 390, 525
 Cattle, 38, 82, 128, 164, 196 (fig.), 280, 286, 399, 404, 443, 473, 566, 658
 Caves, 21, 107
 Centipedes, 38, 443
 Central Leper Hospital, Makongai, 188-9
 Central Medical School, Suva, 78, 188, 192, 345, 347, 558, 653
 Chaleix point, 487
 Challenger, mount, 249
 Chamorro, 4
 Chanel, Le Rev. Père, 294
 Charlotte, British ship, 604

 Charts, 11, 130; appendix, 700-6
 Cheeseman island, 387; description, 393-4
 Chépénéhé, 495, 501, 505, 506
 Cherry island, *see* Anuta
 Chesterfield islands, 414, 465; description, 509
 Chesterfield islet, 509
 Chiefs and native officials, Ellice is., 335; Fiji, 131-5, 154-5, 157, 161-2, 180-4; Futuna (Hoon), 296-7; Gilbert is., 330; Loyalty is., 504; Nauru, 340; New Caledonia, 453-4; New Hebrides, 547-8; Rotuma, 284; Solomon is., 637-40 *passim*, 644, 647-8, 692, 696; Tonga, 44, 59-62; Uvea (Wallis), 288; *see also* Rank
 Chila (Lifu), 462
 China, 528, 567
 Chinese, Fiji, 141 (table), 190, 214, 256; Gilbert and Ellice is., 320, 368; Nauru, 343, 366; New Hebrides, 568, 576; Solomon is., 657
 Choiseul, 607, 609, 612 (plate), 626, 627, 628, 633, 634, 644, 654; description, 674-6 (with figs.)
 Choiseul bay, 675 (with fig.)
 Christianity, Banks is., 559; Ellice is., 335; Fiji, 130, 132, 162, 166; Futuna (Hoon), 294; Gilbert is., 347; Loyalty is., 505; Nauru, 333; New Caledonia, 458; New Hebrides, 542; Norfolk, 404; Rotuma, 271; Solomon is., 630, 637, 644, 645, 653, 676, 687; Tonga, 39, 41, 56, 65, 66; Torres is., 559; Uvea (Wallis), 287; *see also* Churches; Protestant churches and missions; Roman Catholic church and missions
 Christmas island, 303, 318, 339
 Chrome, *see* Chromium
 Chrome Company, 470
 Chromium, 463, 469-73 (with figs. and table)
 Churches, 57 (fig.), 58; *see also* Missions; Protestant churches and missions; Roman Catholic church and missions
 Church of Christ, 560, 594
 Citrus fruits, 404
 Clans, Ellice is., 334; Fiji, 152-5; Gilbert is., 325, 329; Nauru, 331; New Caledonia, 453, 458; New Hebrides, 545-6; Rotuma, 273; Solomon is., 636, 644, 690
 Clayton, Captain, 391
 Climate, Fiji, 119-23 (with figs.); Futuna (Hoon), 293; Gilbert and Ellice is., 307-13 (with figs.); Kermadec, 388; Lord Howe, 408; Nauru, 307-13 *passim*, 311 (fig.); New

- Caledonia, 434-8 (with figs.); New Hebrides, 518 (fig.), 519 (fig.), 520-2 (with figs.); Norfolk, 397-8 (with fig.); Rotuma, 268-9 (with fig.); Solomon is., 614-8 (with fig.); Tonga, 32-6; Uvea (Wallis), 279-80
- Clothing, 161, 166, 458
- Coal, 360, 463, 465
- Coaling stations, 43, 45, 488
- Coasts, Banks is., 594-7; Ellice is., 380-3; Fiji, 119, 237-9, 240-1 (figs.), 242-65 *passim*; Futuna (Hoom), 291-2; Kermadecs, 392-4; Lord Howe, 408; Loyalty is., 498-503; Matthew and Hunter, 604; Nauru, 305-6, 364-5; New Caledonia, 420-32 (with figs.); New Hebrides, 518-9, 575, 577-603 *passim*; Norfolk, 394-6; Rotuma, 267-8; Solomon is., 613, 667-97 *passim*; Tonga, 90-112 *passim*; Torres is., 598-9; Uvea (Wallis), 278
- Cobalt, 463-4
- Cockatoo anchorage, 680
- Cocoa, 6, 37, 524, 531, 560, 564 (fig.), 565, 588, 594
- Coconuts, 4, 37, 79, 198-200 (with fig.), 257, 270, 280, 293, 298, 314, 324, 336, 349, 524, 531, 544, 621, 639, 696-7; as food, 79, 198; as drink, 198, 276; oil, 131, 198, 270, 281, 317, 329, 445, 563
- Coëtlogon passage, 502
- Coffee, 6, 37, 473-7 (with fig.), 524, 531, 565, 588
- Colnett, cape, 426, 427; reef, 426
- Colonial Sugar Refining Co., 164, 167-8, 178, 191-2, 195, 200-4, 215-6, 220-1, 224-5
- Commissaire général de la République française dans le Pacifique*, 8, 415
- Communications, Fiji, 223-30 (with figs.); Futuna (Hoom), 300; Gilbert and Ellice is., 361-3; Lord Howe, 412; Loyalty is., 507; Nauru, 361-3, 365 (fig.); New Caledonia, 492-5; New Hebrides, 571-2; Norfolk, 406; Rotuma, 276; Solomon is., 665-6; Tonga, 89-90, 92, 106, 112; Uvea (Wallis), 290
- Compagnie Calédonienne des Nouvelles-Hébrides, 532, 567
- Compagnie Cotonnière des Nouvelles-Hébrides, 565
- Compagnie des Messageries Maritimes, 289, 492, 567, 571, 572
- Compagnie Française des Nouvelles-Hébrides, 570, 571
- Conception (mission), 445
- Cones (volcanic), 30, 98, 117, 263, 589, 678, 685
- Cook, Captain James, 38, 39, 40, 47, 96, 98, 101, 128, 264, 399, 426, 443, 444, 527, 601, 603
- Cook bay, 603
- Cook point, *see* Houma Toloa
- Cook reef, 426
- Cook's hill, 90
- Copper, 464
- Copra, Fiji, 140, 167, 197-200, 210, 218, 248, 251-4; Futuna (Hoom), 299-300; Gilbert and Ellice is., 317, 348-50, 357 (with fig.); Nauru, 349; New Caledonia, 474, 477 (fig.); New Hebrides, 560, 563-4 (with fig.), 567, 588, 594; Rotuma, 270, 276; Solomon is., 626, 656-7 (with fig.); Tonga, 79-80, 84-5, 108, 112; Uvea (Wallis), 281, 289
- Coquille*, French corvette, 316
- Coral reefs:
- Barrier, Fiji, 119, 212, 215, 220, 237, 242, 246, 250-1, 253, 257-65 *passim*; New Caledonia, 415, 426, 434; Rotuma, 268; Solomon is., 613, 664, 667-97 *passim*; Tonga, 98-9, 103, 108
- Elevated, New Caledonia, 415; New Hebrides, 515; Solomon is., 609, 672
- Fringing, Ellice is., 380-3 *passim*; Fiji, 117, 119, 216, 237, 242-65 *passim*; Gilbert is., 366-80 *passim*; Nauru, 365; New Caledonia, 415, 420-32 *passim*; New Hebrides, 518, 570, 573-603 *passim*; Solomon is., 613, 662, 664, 667-97 *passim*; Tonga, 90-112 *passim*
- General, 87, 102, 105, 107, 114, 408, 502, 518, 613
- Sunken, 370, 577
- Cotton, 37, 134, 164, 195, 198, 211, 217, 473, 474, 477-8, 506, 524, 560, 567, 594
- Coughlan harbour, 689
- Councils and Committees:
- Fiji, Agricultural Advisory Committee, 178; Executive Council, 170; Great Council of Chiefs, 140, 171, 177, 182; Legislative Council, 138, 140, 166, 169-70, 183-5
- Futuna, Council of Chiefs, 299; Council of male householders, 299; District Council, 299
- Lord Howe, Board of Control, 411-2
- Nauru, Advisory Council, 340
- New Caledonia, *Conseil Général*, 439; *Conseil Privé*, 281, 459
- New Hebrides, *Commission consultative des Intérêts économiques français*, 553

Councils and Committees (*contd.*):

Norfolk, Advisory Council, 402;
Executive Council, 402

Solomon is., Advisory Council,
646, 648

Tonga, Cabinet, 69; Legislative
Assembly (Parliament), 69-70; Privy
Council, 69-71

Uvea (Wallis), Village councils,
288

Courts:

Fiji, Magistrates', 185-6; Mercan-
tile, 184; Native, 185; Supreme, 185

Futuna, court of first instance, 299

Gilbert and Ellice is., Native, 339

Nauru, District, 341-2

New Caledonia, Commercial, 460;
Appeal, 460; First Instance, 460

New Hebrides, British National,
555; French National, 555; Joint,
555-6; Native, 556; First Instance,
556

Norfolk island, 402

Solomon is. (mandated), District,
651; Native Affairs, 651; Supreme,
651

Solomon is. (protectorate), High
Commissioner's, 648; Native, 649

Tonga, consular, 72; High Com-
missioner's, 71; Land, 71; Police
Magistrates', 71; Supreme, 71-2

Uvea, 287-8

Crabs, 316

Craftwork, Fiji, 160-1; Solomon is.,
642, 644 (plates), 685, 691; Tonga,
62-3; *see also* Art (Melanesian)

Craig cove, 516, 590

Cranes and derricks, 112, 213, 396, 488,
569, 570, 663

Craters, 29, 30, 103, 111, 117, 251, 257,
258, 265, 278, 392, 393, 516, 575,
589, 592, 595, 596, 679, 685, 695

Crickets, 443

Crime, 72

Crocodiles, 526, 622, 679

Crown Prince range, 618, 670

Crustacea, 443

Cuckoo, 443

Cumberland, cape, 527, 582

Currency, Fiji, 211; Gilbert and Ellice
is., 358; Nauru, 358; New Caledonia,
460; New Hebrides, 567-8; Norfolk,
406; Tonga, 75; Uvea (Wallis),
290

Currency, ceremonial, 631 (plate), 640-
1, 712

Curtis island, 387, 390; description,
393-4

Cuscus, 621, 640

Custard apples, 37

Customs duties, *see* Taxes

Dairy farming, 164, 205-6, 253

Dana, J. D., 305

Dancing, 153

Dart anchorage, 571

Davis, Captain, 318

Death rate, 49 (fig.), 50, 146-7 (fig.),
272, 321

Debrun island, 487

D'Entrecasteaux, Joseph Antoine Bruni,
40, 390, 444, 502, 528, 623

D'Entrecasteaux reefs, 426, 508

Deep bay, 685

Deguala, 502

D'Harcourt, Captain, 441

D'Hestreux passage, 595

Denham, Captain H. Mangles, 131,
390

Denham bay, 387, 389, 392

Denham is., 250

Denigomodu district, 330

Depopulation, 144-5, 450-1 (with
table), 536-7 (with table), 630-1;
see also Population

Des Voeux peak, *see* Koroturanga

Dishot, river, 417, 419, 425, 433, 444,
447; valley, 464, 490

Diamond, H.M.S., 391

Diamond bay, 514, 587, 588

Diamond passage, 582

Dillimore, 676

Dillon, Peter, 528, 623, 695

Dillon bay, 522, 528, 603

Dingo, 621

Dives bay, 526 (plate), 597

Dô, mount, 423

Dogs, 128, 270, 280, 286, 298, 315, 410,
443, 525, 621

Dokin bay, 500

Dolphin island, 584

Dôme de Tiébaghi, 469 (fig.)

Doniambo point, 467 (plate), 487

Dore, mount, 422

Dothio, river, 419, 430

Douarre, Bishop, 444, 445

Double bay, 685, 686

Drehu, *see* Lifu

Drought, 79

Ducks, 128, 280, 443, 525, 577, 621

Ducos peninsula, 422 (fig.), 461

Duff, mission ship, 40, 128, 270, 695

Duff group, *see* Taumako group.

Dugong, 443, 639

Dumbéa, bay, 422, 423, 432, 465;
passage, 423; river, 419, 447; town,
489, 493

Dumont d'Urville, Captain J. S. C.,
130, 390, 497

Dumoulin, cape, 430

Dundui, *see* Nduindui

Dunganon, cape, 670

Duok, *see* Lifu

- Duroc passage, 424
 Dysentery, 76, 282, 295, 557, 630, 651
 Eanikai, 377
 Earthquakes, 292, 387, 417, 516, 517, 518, 611
 East cape (Fauro), 672
 East point (Bougainville), 670
 Eath, *see* Uvea (Loyalty is.)
 Eber, German warship, 318
 Economics, Fiji, 194-211; Futuna (Hoorn), 299-300; Gilbert and Ellice is., 348-59; Lord Howe, 411-2; Loyalty is., 506-7; Nauru, 348-59 *passim*; New Caledonia, 463-86; New Hebrides, 560-8; Norfolk, 404-6; Rotuma, 276; Solomon is., 655-62; Tonga, 62, 78-85; Uvea (Wallis), 289-90
 Eddystone, *see* Simbo
 Education, Fiji, 189-92, 219; Futuna (Hoorn), 299; Gilbert and Ellice is., 345-6, 381; Lord Howe, 412; Loyalty is., 505; Nauru, 346-7; New Caledonia, 462; New Hebrides, 558; Norfolk, 403-4; Solomon is., 653; Tonga, 76-8; Uvea (Wallis), 289
 Edwards, Captain Edward, 40, 112, 270
 Eels, 355
 Efate, 514, 515, 516, 517, 519, 529, 530, 531, 535, 539, 553, 561; description, 573-6 (with figs.)
 Egeria, H.M. surveying ship, 25
 Egeria channel, 86
 Eijebong, native goddess, 333
 'Eiki (Tongan chiefs), 61
 Eita island, 372
 Electricity, 214, 366, 452, 467, 488, 491, 570
 Elephant island, 584
 Elizabeth, brig, 316
 Ellice is., 4, 8, 302-85 *passim*; description, 380-3 (with fig.)
 Ellington wharf, 221, 225, 229
 Ellis, Sir Albert F., 351
 Emae, 553, 585; description, 586-7
 Emau, 574, 575
 Emily bay, 396
 Emperor Gold Mining Co., 191
 Emperor range, 670
 Empress Augusta bay, 670, 671
 Enderbury island, 172
 English road, 96
 Epi, 514, 515, 517, 519, 521, 531, 537, 553, 561; description, 587-8 (with fig.)
 Eradaka, 516, 574, 575
 Erakau lagoon, 570
 Eromanga, 515, 523, 525, 528, 529, 536, 539, 553, 602 (fig.), 603 (fig.); description, 604
 Erronan, *see* Futuna (New Hebrides)
 Escarpé, cape, 500
 Esk, H.M.S., 28
 Esorolando point, 680
 Espiègle anchorage, 378
 Espiritu Santo, 513, 514, 515, 518, 519, 521, 523, 525, 527, 528, 529, 531, 535, 536, 544, 552, 553, 556, 558, 559, 561, 566, 570; description, 581-5 (with fig.)
 Ethel reef, 598
 'Eua, 17, 18, 19 (fig.), 20 (fig.), 30, 31, 36-9, 50; description, 93-6 (with fig.)
 'Euaiki, 92
 'Euskafa, 107
 Europeans, 6, 131, 141, 145, 167-8, 171, 191-3, 214, 217, 219, 248, 320, 343, 366, 368, 390, 448, 568, 576, 580, 629; influence on native culture, 132, 137, 281, 295
 Exchange, ceremonial, 4, 157-8, 455
 Exploring isles, description, 260-1 (with fig.)
 Fabre islet, 508
 Fadaetoa point, 268
 Fafa, 92
 Fahu relationship, 59, 60
 Faiaoué, anchorage, 502; bay, 502; settlement, 505, 507
 Faihava channel, 88
 Faioa, 106; pass, 279
 Fairymead Sugar Co., 687
 Faisi, 662, 663-4 (with plate)
 Faka'amumei anchorage, 88
 Falcon, H.M.S., 24
 Falcon island, *see* Fonuafo'ou
 Falea, 586
 Family organization, Polynesian, 59, 284, 296; Melanesian, 152, 545, 636
 Fanga 'Uta lagoon, 92
 Fangawa islet, 383
 Fanning island, 303, 318, 339, 355, 356
 Faore, 687
 Fara, 680
 Fata point, 105
 Fatuinangi, 100
 Fatutaka, 607; description, 697
 Fauabu, 652
 Fauna, Fiji, 127-8; Gilbert and Ellice is., 315-6; Kermadec is., 389-90; Lord Howe, 410; Nauru, 316; New Caledonia, 442-3; New Hebrides, 524-6; Norfolk, 399; Rotuma, 270; Solomon is., 621-2; Tonga, 38; Uvea (Wallis), 280
 Fauro, 610; description, 672
 Fearn, mariner, 316, 363, 604
 Febvrier-Despointes, Rear-Admiral, 445

- Feillet, Governor, 446
 Fenualoa, 695
 Fetoa, 103
 Fetokopunga, 102
 Fiji, 2, 3, 6, 7, 8, 85, 625; general review, 114-232 (with figs.); individual islands, 233-65 (with figs.)
 Fiji Airways, 229
 Fijian language, 149-50, 190
 Fiji Pastoral Co., 206
Fiji Royal Gazette, 194
Fiji Times and Herald, 194
 Filariasis, 75, 316, 344, 345
 Filipinos, 4
 Finance, Fiji, 175-6 (with fig.); Gilbert and Ellice is., 342; Lord Howe, 412; Nauru, 342-3; New Caledonia, 460; New Hebrides, 556-7; Norfolk, 403; Solomon is., 650; Tonga, 74-5; Uvea (Wallis is.), 289
 Finau Ulukalala II, 40, 41
 Finland, 357
 Fish, 257, 280, 316, 383, 402, 404, 410, 443, 526, 670
 Fishing, 4, 62, 158-9, 207, 274, 286, 298, 336-7 (with fig.), 354-5 (with plates), 481-2, 506, 540, 659-60 (with fig.), 697; commercial, 207, 404; communal fish drives, 156, 337; methods, 287, 298, 336, 455; 506, 544
 Fishing rock, 392
 Flat rock, 689
 Fleetwood bluff, 392
 Flink point, 370
 Floods, 196
 Florida, *see* Nggela
 Flycatcher, 443
 Flying-fish, 316
 'Flying fox', *see* Bats
 Fly river, 4
 Foa, 21, 98; description, 99
 Fofoa, 107
 Fonofono, *see* Lomlom
 Fonoifua, 102
 Fonuafu'ou, 17, 23-28 (with figs.); description, 96
 Fonualei, 17, 28, 29; description, 108
 Fonwary, 419, 447
 Foreland, 587; anchorage, 587
 Forestry, 124, 126, 178, 207, 480-1, 659
 Forests, 125-7, 235, 293, 398, 409, 440, 441, 522 (plate), 523, 619, 620
 Fort-de-France (Martinique), 447
 Fonu'a'a, 98; description, 100
 Fovijung Efau, 268
 Fovijung Emua, 268
 Fowls, *see* Poultry
 Framboesia, 75, 505, 536, 537, 651, 652
 France:
 Administration, Futuna, 291, 299;
 New Caledonia, 459-61; New Hebrides, 534, 552-7; Uvea (Wallis), 287-8
 Communications, 492, 571-2
 Sovereignty, Futuna, 291; New Caledonia, 7, 415, 444-5; New Hebrides, 7, 172, 511, 534; Uvea (Wallis), 276, 281
 Trade, New Caledonia, 469, 472 (table), 473, 485-6 (with fig.); New Hebrides, 561, 567-8 (with fig.); Uvea (Wallis), 290
 Treaties, 42, 533-4
 Franceville, 533
 French Establishments in Oceania, 445
 French National Court, 555
 French reef, 426
 French rock, *see* L'Espérance rock
 Friendly islands, 14, 40; *see also* Tonga
 Frigate birds, 315, 329
 Frogs, 622
 Fulanga, 118, 127, 264
 Fumaroles, 679
 Funafuti, 303, 307, 313, 314, 318, 335, 345, 348, 361, 363; description, 382-3
 Fungasia (Veiongo), 90
 Fungaueva pass, 279
 Futu, 29, 110, 112
 Futuna (Hoon is.), 3, 8, 271, 277, 289, 415, 492; description, 291-301 (with fig.)
 Futuna (New Hebrides), 291, 522, 529, 536, 537, 539; description, 601-3

 Gaucha bay, 501
 Gagi, 682
 Garmal houses, 543-4, 634 (plates), 635 (plate)
 Gannets, 390
 Ganokoro, 330
 Ganongga, 609, 676; description, 679
 Gaols, *see* Prisons
 Gardner island, 322
 Gatukai, 676; description, 678
 Gavutu, harbour, 662; island, 662, 685
 Gazelle harbour, 670, 671
 Geddie, John, 529
 Geology, Fiji, 115-8 (with figs.); Futuna (Hoon is.), 292; Gilbert and Ellice is., 303-4; Kermadec is., 387; Lord Howe, 406-8; Loyalty is., 497-8; Matthew and Hunter, 604; Nauru, 364-5; New Caledonia, 415-9 (with fig.); New Hebrides, 511-6 (with figs.); Norfolk, 394; Rotuma, 266-8; Solomon is., 607-11 (with fig.); Tonga, 15-30 (with figs.); Uvea (Wallis), 278
 George III, 41
 Germany, 43
 Sovereignty, 7, 319, 627
 Trade, New Caledonia, 465, 467, 473
 Treaties, 45-6

- Shee*, 164, 206
 Sijunabeana is., 680, 681, 682
 Gilbert and Ellice is., 172, 188; general review, 302-63; *see also* Ellice islands; Gilbert islands
 Gilbert, Captain, 316, 604
 Gilbert is., 4, 8, 302-68 *passim*; description, 368-80 (with figs.)
 Ginger, 524
 Gizo, 628, 650, 662, 664, 676; description, 679
 Goat island, 408
 Goats, 38, 82, 164, 206, 280, 389-90, 391, 410, 473, 480
 Gold, 7, 194-5, 208, 209, 248, 463, 464, 655, 689
 Gomen, bay, 424, 432, 464; town, 490, 495
 Gongs, 153 (plate), 552 (plate)
 Goodenough, Commodore James Graham, 627
 Goodenough, mount, 577
 Good Hope, *see* Niuafo'ou
 Gordon, mount (Tuvatau), 233
 Gordon, Sir Arthur Hamilton- (later Lord Stanmore), 137, 138, 180, 182-3, 271, 628
 Goro, port, 431, 433, 466 (plate); town, 421 (with fig.), 463, 491, 492
 Gourds, 314, 506
 Government, *see* Administration
 Governments, native, 38-45 *passim*, 131-7 *passim*, 218; *see also* Chiefs and native officials
 Gower, mount, 408
 Gower island, *see* Ndai
 Graciosa bay, 627, 691 (plate), 693
 Grand cascade, 427
 Grand passage, 426
 Grassi lagoon, 677
 Great Astrolabe reef, 249-50
 Great Britain: and Fiji, 133-4; and New Caledonia, 443; and New Hebrides, 532-3
 Administration, Fiji, 170-1; Gilbert and Ellice is., 339, 340; New Hebrides, 534, 552-3; Solomon is., 645-6; Tonga, 69; Western Pacific High Commission, 171-2
 Naval activity, 136, 318, 445, 533, 627
 Sovereignty, Fiji, 7, 115; Gilbert and Ellice is., 7, 303, 339; New Hebrides, 511; Rotuma, 266, 275; Solomon is., 607, 626-7; Tonga, 69
 Trade, Fiji, 209-10 (with fig.); Gilbert and Ellice is., 357-8; Nauru, 358; New Caledonia, 485-6 (with fig.); Solomon is., 661-2 (with fig.)
 Treaties, 43, 45, 46, 626-7
 Great Sea reef, 114 (fig.), 119, 246
 G H (Pacific III)
 Green islands, *see* Nissan
 Green snail shell, 655, 659
 Gregory XVI, Pope, 444
 Grijalva, Hernando de, 316
 Ground nuts, 80, 658
 Guadalcanal, 607, 609, 611, 612, 613, 618, 622, 627, 628, 630, 631, 633, 636, 637, 643, 644, 650, 653, 656, 658, 683; description, 688-9 (with fig.)
 Guadalcanal Sluicing and Dredging Company, 656
 Guam, 2, 4, 8, 188
 Guiana, 445
 Guillain, Governor, 447
 Guppy, H. B., 607
 Gypsum, 465
 Ha'afeva, 102
 Ha'amonga 'a Maui, 67 (fig.), 68, 93
 Ha'ano, 21, 22, 98; description, 99
 Ha'apai group, 14, 30, 31, 39, 41, 44, 47, 50, 51, 70, 76, 78, 79, 87; description, 96-104 (with fig.)
 Ha'atafu, 93
 Hada bay, 690
 Hada Mata, 690
 Hahake district (Uvea), 288
 Hahake (Tonga), 98
 Hakau Homaulu, 100
 Hakau Lahi, 100
 Hakau Muikuku reef, 87
 Halavo village, 683 (plate)
 Hambi island, 581
 Hanahan, 670
 Harcourt bay, 425, 426, 432, 433
 Harvey, bay, 495
 Haszard, mount, 393
 Hatana, 266-7
 Hathorn sound, 678
 Hautambu, 654
 Haut Commissaire de France dans les Nouvelles-Hébrides, 9, 522
 Havannah harbour, 515 (fig.), 519, 533, 575, 576
 Havannah passage, 431
 Hawaiian Board of Missions, 317
 Hawaii, island of, 233
 Hawks, 128, 326
 Hayter bay, 598
 Head-hunting, 630, 631, 681
 Health, 75, 186-9, 277, 282, 557, 651-2
 Heketa, 93
 Henpan, cape, 670
 Heo, 593
 Herald bay, 254
 Herald, H.M.S., 390
 Herald islets, 393
 Hetau island, 670
 Hides, 404, 479, 566, 567
 Hienghène, bay, 427 (fig.), 444; Port, 427, 433, 451, 490; river, 419

- Hifofua*, Tongan vessel, 89
 Higginson, John, 446, 532, 533
 High Commissioner for the Western Pacific, 1, 15, 44, 45, 69, 115, 171-2, 211, 271, 303, 339, 533, 532, 627, 646
Hihifo (Tonga), 108, 109
Hihifo district (Uvea), 288
Hikuleo, 65
Hikutamole, 107
Hilliard channel, 575
Himalayas, 511
Hinduism, 165, 193
History, Fiji, 128-41; Futuna (Hoorn), 293-4; Gilbert and Ellice is., 293-4; Kermadecs, 390-1; Lord Howe, 410-1; Nauru, 316-9; New Caledonia, 443-8; New Hebrides, 526-34; Norfolk, 399-400; Rotuma, 270-1; Solomon is., 622-9; Tonga, 38-47; Uvea (Wallis), 280-1
Hiw, description, 598-9 (and fig.)
Hoffiua, 266-7
Hog harbour, 521 (with fig.), 522, 524, 534, 582, 583
Holland, 7
Holohuiki (Popua), 90
Home bay, 359, 367
Homédeboas peak, 424
Honggo village, 683 (plate)
Hong Kong, 665
Honikulu pass, 278
Honolulu, 1, 2, 223-4, 528
Hookworm, 75-6, 187, 557, 652
Hoorn islands, *see* Futuna
Horses, 38, 93, 128, 206, 280, 286, 399, 404, 413, 473, 480, 566
Hospitals, 76, 187-8, 219, 222, 299, 345, 366, 383, 403, 461, 557-8, 569, 571, 590, 594, 601, 652, 664; *see also* Health; Medical Services.
Hot springs, 517, 394, 395 (fig.), 396 (fig.), 679, 685
Houailou, head, 428; river, 419, 428, 432 (plate); town, 433, 431, 490, 494, 495
Houmafakalele, 105
Houma Toloa (Cook point), 91
Houma (village), 96
Housing, Ellice is., 333 (plates), 334, 382; Fiji, 150-2, 165, 168, 218 (plate); Futuna (Hoorn), 295; Gilbert is., 325; Loyalty is., 504; Nauru, 366; New Caledonia, 453 (plate), 458; New Hebrides, 543-4, 552 (plate); Norfolk, 401; Rotuma, 273; Solomon is., 635 (with plate), 682 (plate), 687 (plate), 690 (plate), 691 (plate); Tonga, 57 (fig.), 58; Uvea (Wallis), 283
Howland, 351
Hudson island, *see* Nanumanga
Hufangalupe, 91
Hull island, 322, 339
Humboldt, mount, 417
Hunga, 88, 104, 107
Hunga Ha'apai, 17; description, 96
Hunganga, 108
Hunga Tonga, 17; description, 96
Hunter, cape, 689
Hunter, Captain John, 687.
Hunter island, 518, 573; description, 604
Hunter, ship, of Calcutta, 316, 363, 604
Hunting, 159, 639
Huon island (Huon du Nord), 508
Huon islands, 414, 444, 465; description, 508-9
Hurricanes, 32, 108, 121, 196, 294, 307, 521, 588, 614
Hutchison bluff, 393
Hutchison creek, 683
Iai, *see* Uvea (Loyalty is.)
Ignambi, 440
Île Nouville, 422
Im Thurn, Sir Everard F., 45, 140
Inda, American brig, 317
India, 85
Indian languages, 190, 194
Indian National Congress, 166
Indians, 6, 141, 142, 145 (fig.), 148, 162-7, 171, 177, 186, 188-9, 190, 191, 194 (plate), 195, 200-2, 204, 206, 214, 216-7, 219, 222, 248, 256
Indispensable reef, 611
Indispensable strait, 687
Indo-China, 447, 485, 492, 495
Indo-China, Bank of, *see* Bank of Indo-China
Indo-Chinese, 6, 538
Industries, 207-8, 482
Infant mortality rate, 49 (fig.), 50, 146-7 (fig.), 272, 282, 321
Influenza, 48, 145, 146, 557, 651
Insects, 38, 443, 507, 526, 622; pests, 656; pest control, 200
Inyeug, Port, 601
Ipari, *see* Tana
Iré bay, 432
Iridium, 195
Irinalan, 668
Iririki, 568
Iron, 463
Islam, *see* Moslems
Island types:
 Coral, Banks is., 597; Gilbert and Ellice is., 303-5; New Hebrides, 585-603 *passim*; Solomon is., 611, 612; Tonga, 21-23, 30, 103; Torres is., 598-9; *see also* Atolls
 Diversity, 3

Island types (*contd.*):

- Elevated coral, Fiji, 118, 242, 262, 259-65 *passim*; Loyalty is., 497-503; Nauru, 367-8; New Hebrides, 516; Ocean, 305-6; Solomon is., 611, 672, 674, 677, 691; Tonga, 104
 High, 3; *see also* Elevated coral and Volcanic
 Volcanic, Banks is., 594-7; Fiji, 115-8, 233-65 *passim*; Kermadecs, 387; Lord Howe, 406-8; Matthew and Hunter, 604; New Caledonia, 415-19; New Hebrides, 511-6, 573-94; Norfolk, 394; Solomon is., 607-11, 667-97 *passim*; Tonga, 15-21; Uvea (Wallis), 278-9
 Isle of Pines, 414, 415, 417, 432, 442, 443, 444, 447, 448, 493; description, 496-7
 Italy, 486
 Ivory nuts, 626, 640, 658
 Iwose, 586
 Jackson, Port, *see* Sydney
 Jackson, Sir Henry, 140
 Jaluit, 2, 360
 Jaluitgesellschaft, 318
 Janet Nichol, ship, 24
 Jangan, 668
 Jang Hing Loong Co., 210
 Japan:
 Communications, 2
 Sovereignty, 8, 319
 Trade, Gilbert and Ellice is., 357-8; New Caledonia, 463, 467-8, 471, 473, 485; Tonga, 85; *see also* Japanese
 Japanese, 6, 303, 372, 449-50, 568, 576, 660
 Java, 447
 Java bay, 680
 Javanese, 6, 450, 507
 Jetties, piers and wharves, Fiji, 211-3, 216, 218-9, 253, 262; Futuna (Hoon), 292, 299; Gilbert and Ellice is., 354, 359-60, 361 (plate), 370-2, 374, 378; Lord Howe, 412; Nauru, 332 (plate), 355 (plate), 360 (with plate); New Caledonia, 432-3, 465, 488-91; New Hebrides, 569, 580; Norfolk, 396; Rotuma, 268; Solomon is., 611, 662-3, 687, 689; Tonga, 32, 87-9
 John Wesley bluffs, 250
 John Williams V, mission schooner, 361
 Jordan, river, *see* Yorn, river
 Kaala, 419, 425
 Kaba, 107
 Kabangaki village, 374
 Kafeate, 424
 Kafoa, 105
 Kaimbu, description, 259
 Kaiyala bay, 250
 Kalakaua, David, King, 318
 Kamba, 130, 132, 133
 Kamba point, 238
 Kambara, 127, 151; description, 264
 Kananu, 462
 Kanatea, 92
 Kanathea, description, 259
 Kandavu, 114, 116, 118, 119, 127; description, 249-51 (with fig.)
 Kao, 17, 31, 98; description, 103-4
 Kapok, 658
 Karoni, 263
 Kasi, mount, 248
 Katafanga, description, 262
 Katapahié, mount, 424
 Kataviti, mount, 424
 Katig, 672
 Kaukau bay, 689
 Kauri pine, 126, 207, 480, 523, 566, 601, 659; gum, 207
 Kautu'utu'u, 108
 Kaurvandra range, 233
 Kava (*Piper methysticum*), 5, 37, 54, 62-5, 82, 153, 164, 274, 287
 Kavanga bay, 243
 Kaveiko pass, 668
 Kaveiniu pass, 668
 Kavieng, 2
 Kela, mount, 679
 Kelelesia, 102
 Kembla, Port, 492
 Kendekende peak, 263
 Kentia palm, 409, 411-2
 Kenutu, 106
 Keppel, 108
 Kermadec, Captain Huon de, 390, 426, 444
 Kermadec islands, 8, 386-94 (with figs.)
 Kernikapa, 682
 Keuca village, 371
 Keumbe cove, 421
 Kia, district, 681; passage, 682
 Kiakaba river, 672
 Kibeck, cape, 689
 Kiebu, 370
 Kiera, 617 (fig.), 618, 629, 654, 664-5 (with plate); district, 645, 646, 650, 652; harbour, 671
 Kilinailau islands, description, 668
 Kimbombo islets, description, 259
 King, electorate (N.S.W.), 406
 Kingfishers, 38, 128
 King, Lieut. Philip Gidley, 396, 399
 King of Fiji, *see* Tui Viti
 Kingston (Norfolk island), 395, 396, 401
 Kioa, 246, 248
 Kirakira, 691
 Koela, 685
 Koghis mountains, 422

- Koinawa village, 372
 Kokenggolo, 654, 676
 Kologilio passage, 682
 Kolo lagoon, 678
 Kolo (Tongan villages), 56
 Koloa, 106
 Kolomaile, 93
 Kolombangara, 652, 672, 676; description, 679
 Kolovai, 93
 Kolovrat, mount, 685
 Komachu, 688
 Komo, 118 (plate); description, 263
 Koné, bay, 424; mount, 424; river, 424; town, 451, 467, 489
 Koniambo, 419
 Konienne flat, 424
 Kopeto, 419
 Korai bay, 689
 Koreovuka, 680; harbour, 680
 Koro, 127; description, 254
 Korombasambasanga (Nambui) range, 234
 Koro Mbasanga, 260
 Koror, 2
 Korotini tableland, 244
 Koroturanga (Des Voeux peak), 251
 Koro Vatu, 254
 Kotabu islet, 370
 Kotu, 18, 102
 Kotu group, 22, 96, 98; description, 102-3
 Koua, 492
 Kouakoué bay, 431, 433
 Kouaoua bay, 428, 433
 Koué, Port, 432, 490
 Koumac, 470, 490, 495
 Kouté, Port, 421
 Kowata, 256
 Krong point, 516, 590
 Kuikuila, 685
 Kula gulf, 676
 Kuma village, 371
 Kumbokala, 680
 Kumbakale anchorage, 675
 Kungava bay, 692
 Kupei, 655
 Kuria, 305, 374 (fig.); description, 375
 Kusage peak, 676
 Kwa cove, 687
 Kwakea, 596
 Labillardière, J. J., 40
 Labour: 208, 450
 Chinese, 356, 450, 535, 660
 Indian, 138, 162-3, 200, 208
 Indo-Chinese, 450, 535, 562
 Japanese, 440-50, 535
 Javanese, 450, 474, 562
 Melanesian, Fiji, 135, 208; Loyalty is., 506, 509; New Caledonia, 450;
 New Hebrides, 135, 543, 561-3; Solomon is., 560
 Micronesian, 135, 355-6
 Polynesian, 84, 135
 Policy, 561-3, 649-50
 Traffic (nineteenth century), 93, 162-3, 218, 318, 383, 391, 530-1, 590, 597, 601, 625-6, 630
 Lady Penrhyn, transport, 390
 La Ferrière, Captain, 444
 La Foa, river, 419, 423; town, 419, 489, 495
 La Forestière sawmill, 467 (plate)
 Lagon de l'Île Surprise, 508
 Lagoons, Fiji, 237, 242-65 *passim*;
 Gilbert and Ellice is., 304-7, 313, 368-83; Lord Howe, 408; Loyalty is., 498-503; New Caledonia, 415-32 *passim*; New Hebrides, 573-603 *passim*; Solomon is., 613, 667-97 *passim*; Tonga, 92, 100; Uvea (Wallis), 278
 Laguerre, Port, 423, 432
 Lauriiri (Santo peak), 514 (fig.), 581
 Laika, 586
 Lakarere, 592
 Lakemba, 133; description, 263
 Lakena, 380
 Lakes, 28, 29, 30, 111, 251, 262, 264, 280, 313, 420, 592, 595, 612, 695
 Lakona bay, 595
 Lalona, 102
 Lamalanga, 558, 559
 Laniap point, 579
 Lambasa, 124, 164, 180, 220-1, 225, 245, 248; river, 220, 245
 Lamb point, 590
 Lambumbu harbour, 580
 La Meurthe, 502
 Lami, 214; river, 212
 Land:
 Alienation and claims, 72-3, 155-6, 176-8, 285, 297, 343-4, 412, 454, 460-1, 531-2, 555, 638-9, 649
 Policy, 72, 176-8, 460-1, 631, 649
 Tenure, Fiji, 155-6, 177, 197; Futuna (Hoorn), 297; Gilbert and Ellice is., 326, 329, 336, 343-4; Lord Howe, 412; Nauru, 332-3; New Caledonia, 454; New Hebrides, 546-7; Norfolk, 403; Rotuma, 273; Solomon is., 638-9; Tonga, 50, 62, 82-4; Uvea (Wallis), 285
 Utilization, 156, 196 (fig.), 199 (fig.); see also Agriculture
 Landings, 32, 99, 100, 101, 102, 103, 106, 110, 111, 112, 268, 292, 307, 368-83 *passim*, 392, 396, 408, 508, 575, 577-80, 582-4
 Langalanga lagoon, 613, 631, 685-6

- Langi*, tombs of Tongan kings, 52, 67-8
Langton island, 682
Lapaha, 52
La Pérouse, Jean François, Comte de, 40, 396, 444, 528, 623, 695
La Roche, anchorage, 499; settlement, 505
Las Tres Marias, *see* Olu Malau
Late, 17, 30, 31; description, 104
Laterite, 670
Laufilitonga, 41
Laugier, bay, 428, 430, 433; cape, 428 (fig.)
Lau group, 114, 115, 118, 129, 132, 135, 148, 155, 160, 195; description, 256-65 (with figs.)
Laurence river, 664
Lauthala, bay, 124, 229, 238; harbour, 240; island, 252
Lautoka, 2, 164, 179, 223, 225, 229; description, 215-7 (with figs.)
Lautour, Port, 558, 584
Lava, 18, 20, 29, 30, 108, 111, 245, 392, 394, 513, 517, 573, 590, 609, 672
Lavaissière cove, 430, 433
Lavena point, 251
Law, Fiji, 184-6; Gilbert and Ellice is., 341; Nauru, 341; New Caledonia, 459-60; New Hebrides, 554-6; Norfolk, 402-3; Rotuma, 275; Solomon is., 648; Tonga 42, 71; Uvea (Wallis), 287-8
Lead, 195, 463, 465
League of Nations, 8, 303, 319, 340
Leava, 299
Lebris bay, 428
Leconte, Captain, 444
Le Hayre, 469
Le Kaori (timber company), 481
Lekin anchorage, 502
Lekuta river, 245
Le Leizour islet, 508
Lelepa, 516, 574, 575
Leliogat, 499
Le Maire, Jacob, 39, 108, 110, 294, 623, 668
Lenakel, 553, 558, 572, 601
Leonidas, immigrant ship, 163
Lepers' island, *see* Omba
Leprosy, 461, 505, 651; leper settlements, 75, 188-9, 253, 344, 345, 461, 505; *see also* Makongai
Leru islet, 683
L'Espérance rock, 387, 390, 394
Leucodermia, 505, 592
Lever's Pacific Plantations, 629, 658, 663, 665, 683, 685
Levuka, 252; administration, 179-80; communications, 223, 225, 229, 361; description, 217-20 (with fig.), 218 (plates); education, 189, 191; history, 106 (plate), 131, 134, 136
Lewin, Ross, 532
Liapari, 680
Lidgbird, mount, 408
Lieutenant island, 682
Lifu, 442, 460, 497, 498, 505; description, 500-1 (with fig.)
Lifuka, 21, 22, 31, 39, 52, 87-8; description, 98-9
Liku (cliffs), 22 (with plate), 23, 37, 91, 98
Likuri harbour, 238, 239
Limestone, 17, 20, 21, 36, 67, 93, 95, 115, 117, 118 (with plate), 261 (fig.), 262 (fig.), 314, 315 (plate), 355 (plate), 367, 368, 394, 396, 513, 514, 515, 526 (plate), 573, 574, 576, 591, 609, 612 (plate), 670, 672, 682, 691
Lingatu cove, 683
Lion peak, 254
Lisburn, cape, 584
Little entrance, 575
Little Makin, *see* Makin Meang
Little Mala, *see* Maramasike
'Little War, The', 138
Livestock, 479-80, 658 (with table); *and see under* names of particular kinds
Lizards, 37, 127, 316, 443, 507, 526, 622
Loa, 263
Lofanga, 98; description, 100
Lofia, 28
Log bay, 598
Loh, 526 (plate); description, 598
Lolopuepue, 593, 594
Lolowai bay, 523 (plate), 558, 559, 593, 594
Lomaiviti group, 132; description, 252-4
Lomaloma, 260
Lombenben, 592
Lomlom, 695
London Missionary Society, Fiji, 129; Gilbert and Ellice is., 317, 346-7, 355, 363, 372, 378; New Hebrides, 529; Tonga, 40
London, Treaty of, 45
Longangua, 593
Longue islet, 509
Lonock bay, 584
Lopevi, 514, 516, 517, 553, 595; description, 589
Lopta, 267
Lord Howe atoll, *see* Ontong Java
Lord Howe island, 8, 386, 406, 408-9 (plates); general description (with fig.), 406-12
Lord Howe island (Santa Cruz group), 693
L'Oregon (timber company), 481

- Los Angeles, 224
 Losolava, 595
 Lotuma, 107
 Louis-Philippe, King, 281
 Lovoni valley, 232
 Loyalty is., 8, 415, 447, 448, 450, 451, 455, 488, 492, 493, 495, 524; description, 497-508
 Luangahu, 99
 Luangua, 668
 Luckner, Count Felix von, 392
 Luganville, bay, 570; settlement, 554, 557, 570-1, 572, 585
 Lulunga group, 102
 Lunga point, 689
 Lusal river, 595

 Ma'afu, 130, 131-3, 135, 136
 Maa peninsula, 423
 Mabo harbour, 686
 Macauley island, 387, 389, 390; description, 393
 Macdonald, mount, 575
 Macdonald, William, 626
 MacLeod, Donald, 531-2
 Madehas, 672
 Madras, 145
 Maewo, 515, 518, 519, 526, 527, 553, 559; description, 590-2 (with fig.)
 Mafana, 106
 Magusaia, 672
 Maiana 369 (fig.); description, 373-4
 Maina, 462
 Maize, 37, 164, 473, 478, 530, 565, 588
 Makaha'a island, 86, 92
 Mukambo, 662, 663, 685
 Makave, 105
 Makekeke College, 77
 Makin, *see* Butaritari
 Makin Meang, 344; description, 370
 Makira, *see* San Cristobal
 Makira bay, 690
 Makongai, 75, 188-9, 229, 253 (plates), 344, 652; description, 253
 Makura, 585; description, 587
 Makwa, 366
 Malaita, 607, 613, 622-56 *passim*; description, 685-7 (with fig.)
 Malake island, 239 (with fig.), 241
 Malapa, 688
 Malapoa point, 569
 Malaria, 75, 270, 536, 557, 622
 Malau, 220
 Malaulalo, 691
 Malaupaina, 691
 Malavaga, 676
 Malayta, *see* Malaita
 Malayta Company, 629, 658, 687
 Malekula, 513-5, 518-9, 521, 522 (plate), 523, 527, 531, 535, 539, 544, 552 (with plate), 553, 556, 558, 559, 561, 566; description, 576-81 (with figs.)
 Mali, island, 220, 246; pass, 246
 Mallicollo, *see* Malekula
 Malo island, 515, 561, 581, 585; description, 584
 Malokilikili, 584
 Maloko peninsula, 678
 Malolo, description, 242
 Malo peak, 584
 Malulu, 670
 Malumba bay, 684
 Malumu bay, 243
 Mamanutha group, description, 242
 Mamurame, 592
 Mana island (Lau group), 264
 Mana island (Mamanutha group), 242
 Manchester Cotton Supply Association, 134
 Mandates, *see* League of Nations
 Manduiloto, 687
 Mane islet, 683
 Manevai bay, 694
 Manganese, 463
 Manggewa, 248
 Mango (Fiji), 117 (fig.), 118, 135; description, 262 (with fig.)
 Mango (Tonga), 17, 18; description, 102
 Mangoiki, 102
 Mangroves, 37, 124, 178, 216, 237, 246, 259, 314, 410, 426, 440, 619, 664, 667, 670, 672-3, 679, 685
 Manihiki, 382
 Manila, 2
 Maninita, 106
 Manioc, 37, 298, 473, 478, 506
 Manning, mariner, 682
 Manning strait, 682
 Manra (Sydney) island, 322
 Maori, 390, 391
 Maps and charts, 11, 700-6
 Marakei, 305, 344, 374 (fig.); description, 371-2
 Maramasike, island, 685; passage, 685
 Marambo, description, 264
 Marau sound, 688, 689
 Mare island, 442, 497, 505; description, 498-500 (with fig.)
 Maria bay, 86
 Marianas, 2, 4, 6, 7, 8
 Marina, *see* Espiritu Santo
 Mariner, William, 40
 Mariner's Cave, 107
 Maringe lagoon, 680-1
 Marists, *see* Mary, Society of
 Market gardening, 82, 164, 404, 535
 Marovo lagoon, 613, 677, 678
 Marqueen island, *see* Tauu
 Marriage, Fiji, 152-4; Gilbert and Ellice is., 325; Loyalty is., 504;

- Nauru, 331; New Caledonia, 453, 454, 458; New Hebrides, 546; Rotuma, 273; Solomon is., 637; Tonga, 63; Uvea (Wallis), 284-5
- Marsh, cape, *see* Russell islands
- Marshall, mariner, 316
- Marshall is., 2, 4, 6, 8, 303, 316, 318
- Marum, mount, 516, 590
- Marunga harbour, 690
- Mary, Port, 691
- Mary, Society of, 182, 193, 271, 281, 444, 445, 559, 571, 576, 580, 585, 590, 592, 594, 601, 624, 628, 687
- Mary Stewart reef, 589
- Masamasa, 673
- Masevotu, 595
- Massim, 5
- Matakiniua, 105
- Matalanga (cliff), 95
- Matapule (Tongan officials), 44, 61, 65
- Mataso, 585, 587
- Matathawa Levu, 256
- Matautu, anchorage, 279; settlement, 287-8, 290
- Mata'utuliki, 105
- Matchin bay, 672
- Matema, 695
- Mathuata island, 239, 241
- Matsi peak, 292
- Matson Line, 223
- Matthew island, 573; description, 604
- Matua, motor vessel, 89
- Matu Avi, 687
- Matuku (Fiji), 117, 257; description, 259
- Matuku (Tonga), 18, 103
- Matupina point, 670
- Matupu bay, 575
- Maurelle, Port, 107
- Maurelle, Spanish navigator, 40, 104
- Mba, river, 119, 124, 132, 225, 235, 237; roadstead, 241; settlement, 180, 221
- Mbambatana, 652, 675
- Mbatiki, description, 253
- Mbau, island, 132, 183; waters, 241
- Mbekana island, 215
- Mbengga, description, 242-3 (with fig.)
- Mboli, harbour, 684; pass, *see* Uruha passage
- Mbua, bay, 247; province, 206
- Mbukatatanoa, 119
- Mbuke Levu, 116, 249
- Mbulia, 250
- Mbutha bay, 247
- Mbuthaisau river, 245
- Meadus bay, *see* Sarnet bay
- Meama, 100
- Measles, 48, 137, 144, 537
- Medical services, Fiji, 172, 186-9; Futuna (Hoorn), 299; Gilbert and Ellice is., 344-5; Lord Howe, 412; Nauru, 345; New Caledonia, 461; New Hebrides, 557; Norfolk, 403; Rotuma, 276; Solomon is., 651-3, 712; Tonga, 75-6; Uvea (Wallis), 282
- Médu, 499
- Megapodes, 577, 685
- Melanesian, 3, 190, 193, 194, 219
- Culture, Fiji, 150-2; New Caledonia, 452-8; New Hebrides, 542-52; Solomon is., 634-45
- Language, Banks is., 539; Fiji, 149-50; Loyalty is., 504; New Caledonia, 452; New Hebrides, 539-42 (with fig.); Solomon is., 632-4; Torres is., 539
- Physical type, Fiji, 148-9, 152 (plate); Loyalty is., 504; Nauru, 323; New Caledonia, 452; New Hebrides, 527 (plate), 538-9; Solomon is., 631-2 (with plate)
- Religion, Fiji, 162; Loyalty is., 505; New Caledonia, 457-8; New Hebrides, 550-1; Solomon is., 644-5
- Melanesian Mission, 400-1, 403, 530, 540-1, 558-9, 592, 594, 595, 597, 624, 628, 634, 652-4, 665, 681, 685, 691
- Melbourne, 224, 361, 507
- Mele bay, 568, 570, 573, 576
- Melsisi, 592
- Mendaña, Alvaro de, 316, 611, 622, 623, 634, 641, 668, 680, 689, 691, 693
- Mendaña, cape, 693
- Mendrausuthu range, 334
- Meneng district, 318
- Mengöne, *see* Mare
- Mera Lava, description, 594
- Mercury, 465
- Merig, description, 594
- Messageries Maritimes, *see* Compagnie des Messageries Maritimes
- Metensa bay, 575, 576
- Methodist Missionary Society of Australasia, 193
- Methodist Missionary Society of New Zealand, 654
- Methodists, 41, 44, 47, 58, 66, 76, 93, 129, 169, 178, 192-3, 220, 221, 271, 275, 402, 404, 628, 634, 652, 654, 670, 676, 681, 685, 691
- Metis, ship, 28
- Metis shoal, 28
- Metoma, 598
- Mexico, 357
- Meyer island, 393
- Micronesian, 4, 322; culture, 325-30; language, 323-4; physical type, 323
- Middle bay, 580

- Middle beach, 408
 Middlegate, 403
 Middle hill (Simbo), 679
 Middle island, *see* Tegua
 Milk, 206, 288
 Milli bay, 597
 Minerals and mining, 7, 194-5, 348, 463-73 (with figs. and table), 560, 655; *see also* Gold; Phosphate; Trade
 Miscegenation, Melanesian-European, 168-9; Polynesian-Asiatic, 271; Polynesian-European, 49, 731, 168-9, 271
 Missions, 347, 362, 517, 558-60, 644, 653-5; and education, 76-7, 163, 192, 299, 346, 347, 462, 558, 653; and government, 43, 294; *see also* Protestant churches and missions; Roman Catholic church and missions
 Mitre island, *see* Fatutaka
 Mixed-bloods, 49, 141 (table), 146, 147 (fig.), 148, 168-9, 214, 219, 248, 320, 401, 568; *see also* Miscegenation
 Moala, 117, 127; description, 256-7
 Mohican, U.S.S., 24
 Moindou bay, 432, 447, 465
 Moindule point, 250
 Molasses, 201, 224-5
 Monavatu peak, 233
 Monéo river, 428
 Mongoose, 128
 Mono, description, 673-4
 Montravel, mount, 488
 Moorhen, 410
 Moresby, John, 380
 Moresby, Port, *see* Port Moresby
 Morikao, 372
 Mormons (Church of Jesus Christ of Latter Day Saints), 77
 Morris, Hedstrom, 210, 214, 225
 Mortlock islands, *see* Tauu
 Moslems, 165-6, 193
 Mosques, 166
 Mosquitoes, 38, 128, 270, 316, 443, 461, 502, 526, 622, 636, 695
 Mota, 530, 539, 594, 596; description, 597
 Mota Lava, 540, 594, 596; description, 597
 Mothe, description, 263
 Motlav, *see* Mota Lava
 Motor vehicles, 53, 89, 164, 168, 290, 406, 495, 507, 527, 666
 Motu, 5
 Moturiki, 237, 238; description, 252-3
 Motusa bay, 268
 Mou, mount, 417, 422; river, 428
 Moumoukai peak, 392
 Mo'ungalafa, 104, 106
 Mo'unga'one, 98, 99; description, 100
 Mount Evans range, 234
 Mount Kasi Mines, 195, 248
 Muá, bay, 279; district, 288
 Mu'a, 51, 52
 Muéo, Port, 424, 432
 Muí Hopohoponga, 91, 92
 Muikuku point, 88, 98
 Muitafuna, 107
 Muitalau, 105
 Muitoulo, 105, 106
 Muli anchorage, 502; settlement, 505
 Munia (Fiji), 261
 Munia (Solomon is.), 673
 Mu'omu'a group, *see* Nomuka group
 Muribenoa village, 378
 Mutton Bird island, 408
 Mutton birds, 390, 399, 410, 508
 Mutual Chemical Company of America, 470
 Mynah, 128
 Nabuni island, 370
 Naingoro point, 250
 Nairai, description, 254
 Naitamba, description, 259
 Naitasiri, 197
 Naithombothombo point, 247
 Naitonitoni, 222, 240
 Nakada, mount, 430
 Nakéty, bay, 430, 433, 447; river, 430; town, 490, 492
 Nakorokoro point, 239
 Nalogo, 695
 Naloto range, 234
 Namalata bay (Kandavu), 250
 Namalata island (Lau group), 261
 Namena, 132
 Namoli, 180, 217
 Namosau, 221
 Namosi, province, 143; village, 153 (plate)
 Namuka, description, 263
 Namuka harbour (Viti Levu), 240
 Nananu i Ra, 239
 Nananu i Thake, 239, 241
 Nandarivatu, 107 (plate), 222, 237
 Nandelaivalau, 252
 Nandi, bay, 239, 241; province, 197; river, 235, 237; settlement, 215, 221
 Nandronga province, 197
 Nanduruloulou, 227
 Nanggara, 240
 Nangiri, 594
 Nanikirata islet, 372
 Nanumanga, 305, 333, 339; description, 380
 Nanumea, 319, 333, 338, 339; description, 380
 Nanuya Lailai, 256
 Nanuya Levu, 256
 Nanuya Mbalavu, 256
 Nanyo Boieki Kaisha, 358

- Narovo, *see* Simbo
 Nasavu river, 245
 Nascu, 221
 Naselesele point, 251
 Nash point, 392
 Nasinu, 140, 191
 Nasivi river, 195
 Nasova, 219
 Natambua, 191, 217
 Natandola, 238; harbour, 440
 Natewa, bay, 247; peninsula, 244, 247; plateau, 244
 Nathalo, 505
 Nathula, 256
 Native administration, *see* Administration; Chiefs and native officials
 Naukathuvu, 256
 Naulivou, 132
 Nauru, 8, 188, 302-85 *passim*, 304 (fig.), 306 (fig.), 311 (fig.), 315 (plates), 332 (plates), 353 (fig.), 355 (plates), 360 (plates); description, 363-6 (with figs.)
 Nauruan Royalty Trust Fund, 343, 347
 Nausori, 164, 180, 221, 227, 236
 Nautilus, trading vessel, 316
 Nautilus shoal, 316
 Naviti, 256
 Navua, river, 235, 237, 252 (plate); roadstead, 240; settlement, 206, 222; uplands, 235
 Navuavua, 239 (fig.)
 Navutuiloma, 264
 Navutuiru, 264
 Navy Department (United States), *see* United States: Government Departments
 Nawono bay, 596
 Nayau, description, 262
 Ndai, description, 687
 Ndaku bay, 250
 Ndavulevu, 192, 221
 Ndavura, 265
 Ndelaikoro, 244
 Ndelaitho' peak, 254
 Ndelaithomboni peak, 254
 Ndeni, 607, 623, 625, 691 (plate); description, 693
 Ndeumba, 237
 Ndoi, 265
 Ndoua, cape, 421 (with fig.), 432
 Ndoundouré, 497, 499
 Ndrawangga, 256
 Ndreketi river, 245
 Nduindui, 560, 593-4
 Néba island, 425
 Ned's beach, 408
 Negritos, 3, 4, 538
 Negropo river, 419, 430
 Néhoué, bay, 425, 470, 492; town, 494-5
 Neiafu, 23 (plate), 31-2, 51-2, 87 (fig.), 88-90, 105, 107
 Nelson bay, 387
 Nendiaran point, 426
 Nepean island, 396, 398 (plate)
 Néra, river, 419, 423
 Netché (Netieh) point, 498
 Netherlands East Indies, 2, 358, 485, 511
 Neuméni peninsula, 431
 New Britain, 7, 8
 New Caledonia, 3, 6, 233, 281, 289, 519, 524, 532; general description, 414-510 (with figs. and plates)
 Newcastle (New South Wales), 360
 New Georgia group, 627, 655; description, 676-80 (with fig.)
 New Georgia island, 607, 613, 624, 628, 655; description, 676-8 (with fig.)
 New Guinea (Dutch), 8, 124
 New Guinea (general), 1-8 *passim*, 361, 511, 524, 660
 New Guinea, Mandated Territory of, 607, 629, 645
 New Hebrides, 3, 8, 135, 172, 406, 415, 450, 477, 492; general review, 511-72 (with figs.); individual islands, 573-606 (with figs.)
 New Ireland, 7
 New South Wales, 8, 386, 400, 406
 New Zealand: 1, 139, 148, 167, 189, 192, 386, 398, 410
 Administration, Kermadecs, 391;
 Nauru, 351-2
 Communications, 2, 89, 224, 229, 361, 406, 492, 572
 Trade, Fiji, 134, 203-4, 208;
 Gilbert and Ellice is., 357-8; Nauru, 357-8; New Caledonia, 465; Norfolk, 405; Solomon is., 662; Tonga, 85
 Ngaloa harbour, 250
 Ngaloa island (Kandavu), 250
 Ngaloa island (Vanua Levu), 246
 Ngara Levu point, 250
 Ngau, description, 254
 Nggamea, description, 251, 252
 Nggawa river, 220, 245
 Nggela, 618, 627, 634, 636, 647, 650, 662; description, 683-5 (with fig.)
 Nggilanggila island, 261 (with fig.); passage, 261
 Nggoma Levu island, 241
 Ngorangora peninsula, 687
 Nguna, 539, 574, 575
 Nickel, 195, 463, 466-9 (with fig.)
 Nidero, 682
 Nielsen, Lars, 626
 Nikunau, 305, 379 (fig.); description, 378

- Nimanoa*, motor vessel, 361
 Ninga, mount, 417
 Niniva, description, 100
 Nippon Kogyo Kaisha, 468
 Nippon Kokan Kabushiki Kaisha, 463
 Nippon Nickel Kaisha, 468
 Nissan, 611, 642; description, 667
 Niuafo'ou, 15, 17, 29-31, 34, 39, 47, 70, 80, 90, 110 (fig.); description, 111-2 (with figs.)
 Niuatoputapu, 15, 17, 30, 31, 34, 39, 47, 70, 79, 90, 109 (fig.); description, 108
 Niuaunono, 91
 Niue, 188
 Niulakita, 305, 349, 351; description, 383
 Niutao, 313, 333, 339; description, 380
 Niutoua, 108
 Niwula, 396
 Njai passage, 678
 Noata, 267-8, 270
 Noddies, 315, 410
 Nomuka group, 17-18, 96; description, 100-2 (with fig.)
 Nomukaiki, 17, 101
 Nomuka island, 17, 21-2, 24, 39, 83; description, 100-2 (with fig.)
 Nondoué, 465
 Nonouti, 307; description, 375, 376 (fig.)
Nopele (Tongan nobles), 61
 Norbarbar, *see* Ureparapara
 Nord-deutscher Lloyd line, 665
 Norfolk island, 8, 317, 386, 389, 398-9 (plates), 628; general description, 394-406 (with figs.)
 Norsup, 557, 565, 572, 580
 North bay (Fauro), 672, 673
 North-east point (Futuna), 603
 North peak (Lord Howe), 408
 North point (Maewo), 590
 North-west channel (Abaiang), 372
 Nou island, 422, 487, 495
 Noumea, 1, 422, 432, 461, 467 (plate), 486 (with fig.), 487 (fig.), 488-9 (plates); administration, 459; communications, 492-4; history, 445, 447, 487; port, 487-8; town, 488-9; trade, 481
 Nouvelle Compagnie Forestière Calédonienne, 480
 Nova Scotia, 529
 Nuapapu, 88, 107
 Nufiloli, 695
 Nuguti, 377
 Nui, 319, 333, 337; description, 380-1
 Nukapu, 695
 Nuku'alofa, 2, 31, 33 (fig.), 34, 35 (fig.), 43, 56, 90; anchorage, 86; approaches, 86; port, 87; town, 51-2
 Nukufai'au, 102
 Nukufetau, 337; description, 381-2 (with fig.)
 Nukulaelae, 318, 337, 348, 381 (fig.); description, 383
 Nukulakita, *see* Niulakita
 Nukulau, Port, 240
 Nukumalolo, 105
 Nukumanu, 611; description, 668
 Nukumanu village (Nikunau), 378
 Nukumaro (Gardner) island, 322
 Nukunuku, 92
 Nukupule, 100
 Nukutula, 102
 Numanuma, 672
 Numbukulou creek, 211-2
 Nupani, 695
 Nurakita, *see* Niulakita
 Nutunana channel, 670
 Oa Raha, *see* Santa Ana
 O'Brien, Sir George, 140
 Occupations, *see* Economics
 Ocean island, 8, 302-85 *passim*, 308 (fig.), 310 (fig.), 312 (fig.); description, 366-8 (with fig.)
 Ocean, ship, 316, 366
 Ofolanga, description, 99
 Ofu, 106
 Ohonua, 95, 96
 Ohope bay, 432
 Oil palms, West African, 658
 Oinafa village, 266, 268
 Okoa, 106
 Oldham, Commander, 25
 Olevuga, 683
 Olorua, description, 263
 'Olo'ua, 106
 Olry, Port, 582, 584, 585
 Olu Malau, 618, 691
 Omba, 517, 523 (plate), 526, 527, 553, 554, 559, 560, 565; description, 592-4 (with fig.)
 On Chong and Co., 358
 Oné (Uvea), 462
 Oneaka, 375
 Oneata (Fiji), 263
 Oneata (Tonga), 92
 One Pusu, 654
 Onevai, 92
 Ongea Ndriki, 195
 Onne, 370
 Ono i Kandavu, 249
 Ono i Lau, 128; description, 264-5
 Onoa, 663
 Onotoa, 321, 355, 376 (fig.); description, 378-9
 Ontong Java, 607, 611, 612, 623, 627, 630, 632, 647; description, 668-9 (with fig.)
 Opa, *see* Omba

- Oranges, 37, 103, 286, 298, 524
 Orders in Council, 171-2, 339, 648
 Orlofe, 663
 Orons (Hull) island, 322
 Ortega channel, 682
 Ota, 107
 Otmanmeretakak, mount, 592
 Ottawa Agreement, 209
 'Otu Tolu, description, 102
 'O'ua, 102
 Ouaco, 424 (fig.), 432, 452 (plate), 474, 482, 490
 Ouaième river, 427
 Ouazangou, mount, 424
 Oubatche, 426, 464, 490
 Oué, 507
 Ouégoa, 490
 Ouenghi river, 419, 423, 432 (plate)
 Ouen island, 421, 432, 470
 Ouin, mount, 417
 Ouinné bay, 431, 433
 Ounda, point, 424; bay, 432
 Ounia, Port, 431, 433
 Ovaka, 107
 Ovalau, 131, 132, 204, 237, 238; description, 252-3
 Ovau, 673
 Ovi harbour, 689
 Owls, 38, 128
- Paagoumène, bay, 425, 470; point, 425
 Paagoumène, Port, 425, 432, 433 (plate), 490, 492-3
 Paama, 537, 553; description, 589
 Pachu, river, 612 (plate)
 Pacific Islands Company, 351, 628-9
 Pacific Phosphate Company, 351
 Paddon, trader, 445, 528
 Paddon cove, 495
 Paeva village, 678
 Paita, 447, 489, 493
 Palao bay, 576
 Palikulo, 582
 Pam, bay, 426, 433, 490; island, 419, 425, 426; settlement, 490
 Panama Canal, 492
 Pan-American Airways, 229, 495
 Pandanus, 4, 37, 126, 242, 293, 314, 324, 325, 349, 375, 498, 695, 696
 Pandora, H.M.S., 112, 270
 Pangai ('Eua), 96
 Pangai (Lifuka), 32, 51, 52, 57, 90, 99
 Pangaimotu, 31 (with plate), 57, 92, 105, 106, 107
 Pangikumu, bay, 580; river, 576
 Pango Pango, 224
 Pango point, 570
 Panie, mount, 417, 426
 Papaya, 37, 270, 298, 349, 498, 524, 544, 621, 639
 Papeete, 528
- Papua, 3, 4, 8
 Papua, Gulf of, 4
 Papuan languages, 632-3
 Parakeets, 128, 443
 Parrots, 128, 621
 Passes, *see* Ship passes
 Passion fruit, 404
 Paton, John G., 537
 Paton point, 603
 Patrick, Port, 601
 Patteson, John Coleridge, 624
 Patteson, Port, 522, 596-7
 Paula concession, 465
 Paut point, 596
 Pau Uma, *see* Paama
 Pavuvu, 682, 683
 Peacock anchorage, 377
 Peacock, U.S. vessel, 380
 Pearls and pearl shell, 271, 355, 445, 626; *see also* Trochus shell; Green snail shell
 Pelau, 668, 669
 Pele, 574, 575
 Penang (Fiji), 221
 Penang Sugar Estate (Fiji), 200
 Penguin, H.M.S., 28
 Penrose patches, 681
 Penot, mount, 514, 576
 Pentecost, *see* Raga
 Pepesala bay, 683
 Permanent Committee on Geographical Names, 12, 13, 149, 707-9 *passim*
 Peru, 622; labour traffic, 93, 318
 Petats, 639 (plate)
 Peu, 662, 664, 694
 Peyster, mariner, 316
 Philippine islands, 1, 2, 469, 473
 Phillip island (Lord Howe), 408
 Phillip island (Norfolk), 395-6, 398 (plate)
 Phoenix islands, 1, 172, 303, 318, 322, 351, 378
 Phosphate, central equatorial is., 351; Chesterfield is., 509; Fiji, 195; Gilbert and Ellice is., 383; Huon is., 508-9; Nauru, 303, 348, 351-4 (with fig.), 355 (plate), 356-7, 364 (fig.); New Caledonia, 465; Ocean, 303, 318, 348, 351-4 (with fig.), 356-7, 359, 367 (fig.); Solomon is., 656; Tonga, 96; Walpole is., 507-8
 Picot bay, 599
 Pidgin-English, 633
 Piedue, 673
 Piers, *see* Jetties, piers and wharves
 Pigard, Ensign, 444
 Pigeons, 38, 128, 159, 259, 404, 410, 443, 577, 621
 Pigs, 38, 43, 80, 82, 103, 127, 128, 153, 159, 205-6, 257, 270, 274, 280, 286, 298, 316, 383, 389, 399, 404, 410,

- 443, 473, 480, 524, 525, 544, 545, 621, 640, 670
 Piha passage, 86
 Pileni, 695
 Pineapples, 37, 79, 80, 197, 204, 217, 252, 349, 479
 Pirogues bay, 470
 Pitcairn, 188, 400
 Pitt, British ship, 682
 Pitt, mount, 394, 399
 Piuli, 668
 Place-names, 12, 707-9
 Plaine des Lacs, 417, 420, 431, 442, 470
 Plantains, 78, 112, 270
 Plantations, European:
 Banana, Fiji, 203-4 (with fig.);
 New Hebrides, 565; Norfolk, 404;
 Solomon is., 655-6, 682
 Coconut, Fiji, 198-200 (with fig.),
 205, 262; Gilbert and Ellice is., 349;
 New Caledonia, 476-7 (with fig.);
 New Hebrides, 563, 564 (with fig.),
 590; Solomon is., 683, 689, 691
 Coffee, New Caledonia, 474-6
 (with fig.); New Hebrides, 565, 588
 Cotton, Fiji, 134-5, 198; New
 Caledonia, 477-8, 565; Rotuma, 271
 Maize, New Caledonia, 478; New
 Hebrides, 565, 588
 Pineapple, Fiji, 204, 217, 252
 Rubber, Fiji, 205; Solomon is., 658
 Sugar, Fiji, 200-1 (with fig.), 220-3
 (with fig.); New Caledonia, 478
 See also Agriculture; Labour
 Planter point, 580
 Plateau de Dogny, 419
 Pleasant island, *see* Nauru
 Pleiades, the (Loyalty is.), 497; de-
 scription, 502
 Plum, 471, 494
 Poine bay, 499
 Poindimié, 451, 490
 Pokpok, *see* Bakawari island
 Polenia bay, 603
 Police, 72, 186, 299, 341-2, 554, 556,
 649
 Poloa, 92
 Polynesian, 3, 4, 214
 Culture, Ellice is., 333-9; Futuna
 (Hoorn), 295-8; Kermadecs, 390;
 New Caledonia, 453; Rotuma, 273-
 5; Solomon is., 634, 695-6; Tonga,
 56-68; Uvea (Wallis), 283-7
 Language, Ellice is., 323-4; Fiji,
 149-50; Futuna (Hoorn), 295;
 Loyalty is., 504; New Hebrides, 539;
 Rotuma, 272-3; Solomon is., 632;
 Tonga, 53-6; Uvea (Wallis), 283
 Physical type, Ellice is., 323;
 Fiji, 148; Futuna (Hoorn), 295;
 Loyalty is., 504; New Hebrides, 538,
 600; Rotuma, 272; Solomon is., 152
 (plate), 630 (plate), 632, 695-6;
 Tonga, 53; Uvea (Wallis), 282-3
 Religion (ancient), Ellice is., 338-
 9; Futuna (Hoorn), 297; Rotuma,
 275; Tonga, 63-6, 103; Uvea (Wallis),
 287
 Ponérihouen, river, 419, 428; settle-
 ment, 451, 490, 495
 Popau harbour, 689
 Poperang, 663-4, 672
 Popogia, mount, 693
 Popomanasiu, mount, 612, 688
 Popua (Holoheiki), 90
 Population:
 Fiji, 141-8 (with table and figs.),
 214, 219, 241-3, 248-65 *passim*;
 Futuna (Hoorn), 294-5; Gilbert and
 Ellice is., 319-22 (with tables), 368-
 83 *passim*; Kermadecs, 392; Lord
 Howe, 411; Loyalty is., 503; Nauru,
 320-1 (with tables), 366; New
 Caledonia, 448-51 (with table), 486,
 489-91; New Hebrides, 534-8 (with
 tables), 574-603 *passim*; Norfolk,
 401; Rotuma, 271-2 (with table);
 Solomon is., 629-31 (with table),
 667-97 *passim*; Tonga, 45-53 (with
 table and figs.), 93-112 *passim*;
 Uvea (Wallis), 282
 Age distribution, 147-8 (with fig.);
 density, 50-1 (with table), 142-4
 (with figs.), 319, 630
 See also Birth rate; Death rate;
 Depopulation; Settlements; Sex ratio
 Poro, bay, 428, 433; settlement, 490
 Poro'u'ua, 687
 Porpoises, 639
 Port-au-Prince, privateer, 40
 Port au Prince point, 98
 Port-de-France, *see* Noumea
 Port Moresby, 2, 5
 Ports and Harbours, Fiji, 211-21;
 Gilbert is., 359-60, 370-2; Nauru,
 360; New Caledonia, 432-4, 486-91;
 New Hebrides, 568-71; Solomon
 is., 662-5; Tonga, 86-9
 Postal services, Fiji, 229-30; Lord
 Howe, 406; New Hebrides, 571;
 Norfolk, 406; Tonga, 90
 Potatoes, 274, 478
 Potnaraven, 603 (fig.)
 Pottery, 5, 158, 160-1
 Pott island, 425
 Poudiou island, 426
 Pouembout, 471
 Poultry, 38, 82, 128, 159, 257, 280, 286,
 298, 383, 399
 Poura reef, 426
 Poudre, peninsula, 425, 432; settle-
 ment, 494, 495

Pourina bay, 431
 Power stations, *see* Electricity
 Poya bay, 423, 432, 464; settlement, 465, 489
 Presbyterian mission, 558-9, 576, 580, 585, 588, 590, 601, 603
 Prins Wyllem's is., 128
 Prisons, 72, 186, 341, 556, 649
 Pritchard, W. T., 133, 134
 Proby island, *see* Niuafo'ou
 Prony bay, 421, 432, 480, 481, 493
 Property, communal, 156, 285, 332; individual, 156, 285, 332; in fishing grounds, 156, 332; *see also* Land: Tenure
 Protestant churches and missions, 40, 42, 129-30, 193, 281, 402, 505, 529; *see also* Church of Christ; London Missionary Society; Melanesian Mission; Methodists; Mormons; Presbyterian mission; Seventh Day Adventists; South Seas Evangelical Mission
 Puébo, passage, 444; Port, 426, 433, 445, 447
 Puke, mount, *see* Schouten, mount
 Pumpkins, 37
 Pupukuna point, 670
 Purvis, Port, 683
 Putuputua, 102
 Pygmies, 538
 Pylstaart, *see* 'Ata

Quays, *see* jetties, piers and wharves
 Queen Carola harbour, 670
 Queen Charlotte, cape, 431
 Queensland, 2, 524, 625, 654
 Queensland Kanaka Mission, 628
 Quiros, cape, 582
 Quiros, Pedro Fernandez de, 526, 590, 594, 623
 Quotas, 81

Raa islet, 597
 Rabaul, 1, 363, 643, 665
 Rabbits, 280, 396, 399
 Radio telephones, *see* Telephones
 Raga, 515, 517-8, 526, 535, 537, 553, 559, 561; description, 590-2 (with fig.)
 Railways, 195 (plate), 215, 220, 225-6, 362, 465, 471, 489, 491, 493
 Rairaimatuku plateau, 233
 Rambai, 246; description, 248
 Ramos, description, 687
 Rangitahua, 390
 Rank:
 Melanesian, Fiji, 138, 154-5;
 Loyalty is., 504; New Caledonia, 453;
 New Hebrides, 547-8; Solomon is., 638

Rank (*contd.*):
 Micronesian, 326
 Polynesian, Ellice is., 335; Futuna (Hoon), 296; Rotuma, 273; Tonga, 59-62; Uvea (Wallis), 284
 See also Chiefs and native officials
 Rannou anchorage, 590
 Rano, 516
 Raoul island, 387-91; description, 392-3
 Rats, 38, 127, 128, 270, 315, 389, 443, 524, 621
 Raus, 672
 Ravenga, 596
 Ravines, 30, 103
 Raviravi point, 246
 Rawanawi, 371
 Rayner point, 392, 393
 Reani, 695
 Rebecca, American vessel, 316
 Recherche bay, *see* Hada bay
 Reef islands, 607, 632, 645; description, 695
 Reef islets (Banks is.), *see* Rowa
 Refuge, Port, 106
 Rekata bay, 680-1
 Renard cove (Rendova), 679
 Renard sound (Banika), 683
 Rendova, harbour, 613, 679; peak, 678
 Rendova island, 658, 676; description, 678-9
 Renée river, 371
 Rennell island, 287, 607, 612, 630, 632, 647, 656; description, 691-3 (with fig.)
 Resolution, Port, 515, 517, 528, 601
 Réunion, 446
 Rewa Co-operative Dairy Company, 206
 Rewa, district, 134, 135, 197; *matanitu*, 132; river, 119, 124, 221, 235, 238; roadstead, 241
 Rhapuna river, 596
 Rhinoceros beetle, 79, 289
 Ribono island, 372
 Rice, 165; cultivated, 164, 204-5 (with table), 248, 478; imported, 204, 485, 567, 661
 Richards point, 570
 Ringdove anchorage (Tikopia), 695
 Ringdove bay (Epi), 587, 588
 Ringdove bay (Vangunu), 678
 Rivers and streams, Banks is., 595-6; Fiji, 118, 219 (plate), 235-7 (with fig.), 245 (with fig.), 250-1, 253 (plate); Futuna (Hoon), 293; Lord Howe, 408; New Caledonia, 418 (fig.), 419-20, 429 (fig.), 430 (fig.); New Hebrides, 574, 576, 581, 590; Norfolk, 394; Solomon is., 577 (plate), 612 (with plate), 656, 688; Tonga, 93

- Roads, Fiji, 179, 226-8 (with fig.), 253; Gilbert and Ellice is., 362-3, 370, 374-5; Lord Howe, 412; Loyalty is., 507; New Caledonia, 488-9, 491, 494-5; New Hebrides, 572; Norfolk, 406, Rotuma, 276; Solomon is., 666, 690 (plate); Tonga, 23 (plate), 53, 58, 89, 92-3, 96, 98, 106, 112; Uvea (Wallis), 290; *see also* Tracks
- Ro bay, 498, 499; settlement, 505
- Robertson, mount, 603
- Robinson, Sir Hercules, 137
- Rob Roy island, 676
- Rockefeller Foundation, 76, 187-8, 557, 632
- Rocks:
- Conglomerate, 18, 22, 118 (plate), 243 (fig.), 513
 - Igneous, 194, 655
 - Metamorphic, 115, 417, 463
 - Sedimentary, 417, 419, 513, 609, 672, 691; *see also* Limestone
 - Volcanic, 17-18, 20, 95, 115, 118, 394, 398 (plate), 513-4, 517, 523 (plate), 577, 672, 686 (plate), 689; ashy, 17, 25-7, 36, 111, 517; pumiceous, 17, 27, 115, 392, 513-4, 576, 672
- See also* Basalt; Geology; Lava; Limestone
- Rodd's anchorage, 590
- Roku tui* (Fijian title), *see* Rank: Melanesian, Fiji
- Roman Catholic church and missions, 42, 76-7, 169, 192-3, 220, 275, 287, 297, 372, 444, 505, 558-9, 624, 653-4, 676; *see also* Mary, Society of; Sacred Heart, Society of
- Roncador reef, 611
- Rongata village, 378
- Rongorongo, 378
- Rotuma, 3, 114, 225, 229; description, 266-76 (with figs.)
- Roussin, cape, 499
- Roviana lagoon, 613, 626, 631, 665 (plate), 676-8
- Rovondrau bay, 238, 240
- Rowa, 594; description, 597
- Royalist harbour, 686
- Royal Mail Packet Line (K.P.M.), 492, 571
- Royal Palace, Nuku'alofa, 51, 106 (plate)
- Rua Sura, 628, 689
- Rubber, 6, 205, 473, 506, 658
- Rukuruku bay, 246, 247
- Rum, 478
- Russell islands, 611, 619, 650, 656, 658; description, 682-3
- Sa'a, 633-4
- Sabben bay, 693
- Sacred Heart, Society of, 317
- Saddle island, *see* Mota Lava; Loh
- Saddle peaks, 600
- Sago, 4, 270, 621, 696-7
- Saigon, 495
- Sain channel, 292
- St. George's island, *see* San Jorge
- St. Joseph (Loyalty is.), 505
- St. Louis mission, 445, 453 (plate)
- St. Philip and St. James bay, 527, 581-2, 584-5
- St. Vincent, bay, 423, 432, 433 (plate); mount, 417, 423
- Saipan, 2, 6
- Sakau, 577, 582
- Salamaua, 2
- Salote, Queen, *see* Tupou family
- Samarai, 2
- Sambi head, 674
- Samoa, 14, 124, 318, 382
- San Cristobal, 609, 612, 613, 622, 624, 627, 631, 633, 641, 643, 644, 690; description, 689-91 (with fig.)
- Sandal bay, 500, 501
- Sandalwood, 129-30, 270, 444-5, 481, 506, 523, 528, 566-7, 603
- Sandfly, H.M.S., 627
- Sandfly passage, 683
- Sandwich, Port, 519, 527, 531, 533, 553, 577-80
- Sandy islet, 509
- San Francisco, 224, 229, 495
- San Jorge, 680, 682
- Santa Ana, 611-2, 690 (with plate); description, 691
- Santa Catalina, 611, 690; description, 691
- Santa Cruz island, *see* Ndeni
- Santa Cruz islands, 518, 627; description, 693-5 (with fig.)
- Santa Isabel, *see* Ysabel
- Santa Maria, *see* Gaua
- Santo peak, *see* Laiiriiri
- Sappho, H.M.S., 24, 28
- Sarakata river, 571
- Sarawanga river, 245
- Sarcelle passage, 432
- Sarmet bay, 580
- Sasun anchorage, 580
- Sausau pass, 246
- Savage, Charles, 132
- Savo, 609, 610, 611, 612, 632, 633, 650; description, 685
- Savussvu, bay, 247; settlement, 192
- Scarborough, British ship, 316
- Schouten, mount, 292
- Schouten, Willem Corneliszoon, 39, 108, 110, 112, 294, 668
- Scorff bay, 598

- Scorpions, 443
 Sea snakes, 443
 Seatovo peninsula, 244
 Sébart cove, 432
 Seddon, Rt. Hon. R. J., 140
 Seemann, Berthold, 134
 Second channel, 519, 531, 538, 560, 569 (fig.), 572, 582, 584, 585; description, 570-1
 Seine, French corvette, 444
 Seine reef, 426
 Seismic sea waves, 31
 Selwyn bay, 691
 Selwyn, Rt. Rev. G. A., 400, 529, 624
 Seniang district, 543 (fig.), 547, 552 (plate)
 Sepik river, 5
 Serua (Yarawa) harbour, 238, 240
 Sasaki point, 587
 Seseleka, mount, 246
 Settlements, Ellice is., 334, 380-3 *passim*; Fiji, 150-2 (fig.), 211-23 (with figs.), 242-65 *passim*; Futuna (Hoorn), 295; Gilbert is., 323, 366-80 *passim*; Loyalty is., 498-503; Nauru, 330, 366; New Caledonia, 486-91; New Hebrides, 543-4 (with figs.), 568-71, 573-603 *passim*; Norfolk, 401; Rotuma, 272; Solomon is., 620, 635, 662-5, 667-97 *passim*; Tonga, 51-3, 90-112 *passim*; Uvea (Wallis), 283
 Seventh Day Adventists, 77, 193, 402, 404, 558-60, 585, 590, 594, 601, 628, 652, 655, 676, 692
 Sex ratio, 148, 271 (table), 295, 537
 Shanghai, 2
 Shark bay, 582
 Sheep, 38, 128, 389, 443, 473, 480, 525, 566
 Shellfish, 280, 443
 Shepherd islands, 553; description, 585-6 (with fig.)
 Ship passes, Fiji, 212, 215, 218, 220, 237-43, 246-65 *passim*; Futuna (Hoorn), 292; Gilbert and Ellice is., 307, 368-83 *passim*; Lord Howe, 408; New Caledonia, 432-4; New Hebrides, 569-70, 573-603 *passim*; Solomon is., 664, 667-97 *passim*; Tonga, 86-8, 90-112 *passim*; Uvea (Wallis), 278-9
 Shipping, 1, 2 (fig.), 89, 223-5, 276, 290, 361-2, 492-3, 507, 571, 665
 Shortland group, 650; description, 672-3 (with fig.)
 Shortland harbour, *see* Faiss
 Shortland island, 617 (fig.), 618; description, 672
 Shortland, Lieut. John, 623
 Siassi, 5
 Signal communications, *see* Cables, submarine; Telegraphs; Telephones; Wireless telegraph
 Sikaiana, 607, 624, 632, 647; description, 687-8 (with plates)
 Sikhs, 165; *see also* Indians
 Sikopo, 682
 Simbo island, 610; description, 679
 Simbo islet, 679
 Singatoka, river, 219 (plate), 225, 235, 237; settlement, 221, 229
 Singave district, 299
 Siota, 624, 628, 654, 685
 Sir Charles Hardy's islands, *see* Nissan
 Sisietia village, 635 (plate)
 Siwai district, 632, 666
 Smaile bay, 514
 Snakes, 38, 127, 526, 622
 'Soapstones', 115, 245, 573-4
 Social services, Fiji, 186-94; Futuna (Hoorn), 299; Gilbert and Ellice is., 344-7; Lord Howe, 412; Nauru, 344-7 *passim*; New Caledonia, 461-2; New Hebrides, 557-60; Norfolk, 403-4; Rotuma, 275-6; Solomon is., 651-5; Tonga, 75-8; Uvea (Wallis), 287-9
 Société Calédonia, *see* Société des Hauts-Fourneaux de Nouméa
 Société Calédonickel, 467, 482
 Société Chimique du Chrome, 470
 Société de l'Exploitation de la Mine Chagrin, 470
 Société des Hauts-Fourneaux de Nouméa (Société Calédonia), 422 (fig.), 465, 466, 467, 469
 Société des Mines du Diabot, 465
 Société La Tiébaghi, 470
 Société Le Fer, 463
 Société Le Nickel, 449, 466, 469, 492
 Société Minière de l'Océanie, 468
 Soils, 36, 37, 112, 124, 270, 293, 314, 348, 382, 391, 394, 473, 515, 618-9, 691
 Solkope, 267-8
 Solnahu, 267
 Solomon islands, 3, 8, 450, 524, 577 (plates); general review, 607-66 (with figs. and plates); individual islands, 667-97 (with figs. and plates)
 Soloroa peak, 266
 Somosomo, *matamitu*, 132; strait, 251
 Sophia island, *see* Niulakita
 Sorvohio river, 656, 689
 Soso bay, 230
 South bay, 575
 Southern Cross reef, 662
 South head (Vanua Lava), 596
 South hill (Simbo), 679
 South passage (Abemama), 374

- South Seas Evangelical Mission, 628, 654, 687, 692
 South-west bay (Malekula), 580-1
 Sovereignty in Western Pacific islands, 3 (fig.), 7-8; *see also* under names of countries
 Spain, 7; *see also* Spaniards
 Spaniards, 526, 622; *see also* Mendaña, Alvaro de; Quiros, Pedro Fernandez de
 Stanley, Port, 577, 580
 Stanmore, Lord, *see* Gordon, Sir Arthur Hamilton-
 Star harbour, 689, 691
 Stella passage, 393
 Stewart island, *see* Sikaiana
 Stirling, description, 674
 Stock raising, *see* Cattle
 Stone monuments, 67 (with fig.)
 Strachan harbour, 248
 Styx passage, 502
 Suelhof peak, 266
 Sugar, 6, 139, 141, 224, 248, 478; cane, 37, 158, 197, 274, 280, 498, 544; commercial production, 195 (plate), 200-3 (with figs.); trade, 140, 202 (fig.), 209; *see also* Molasses; Plantations, European: Sugar
 Sugarloaf island, *see* Mota
 Sulphur, 26, 28, 560, 597, 685
 Sulu Vou (Sulu Fou), 636
 Sumatra, 511
 Sumbi, anchorage, 675; head, 674
 Sunday island, *see* Raoul island
 Sunlight channel, 682
 Supply, storeship, 410
 Suretamati, mount, 595
 Surprise islet, 508
 Surville, cape, 689
 Susui, 261
 Su'u harbour, 687
 Suulaha cove, 686
 Su'umoli harbour, 687
 Suva, 1, 168, 183, 187-9, 191, 192, 194; administration, 179-80; communications, 223-5, 227, 229, 363, 572; history, 140, 211; port, 211-3 (with fig. and plates), 219 (plate); town, 213-4 (with plates); trade, 164, 214-5
Scallow, exploring vessel, 687
 Swallow islands, *see* Reef islands
 Sweet potatoes, 37, 78, 80, 158, 286, 314, 402, 506
 Sydney, 223-4, 399, 412, 492, 495, 571, 665
 Sydney bay (Norfolk), 396
 Sydney point (Ocean), 367
 Table anchorage, 584
 Table Unio, 419
 Taboiaki, 378
 Tabonteba, 372
 Tabontebra, 372
 Tabukinberu, 378
 Taburig, native god, 333
 Tabwemasana, mount, 513, 522, 581
 Tabwewa, 329, 330, 362, 368
 Tadiné (Mare), 495, 498, 507
 Tadinou bay, 498
 Taerno passage, 433
 Tafahi, 17, 47; description, 108-10 (with fig.)
 Tagabe river, 569
 Tagoro, Melanesian deity, 550, 592
 Tahiti, 318, 445, 492, 528
 Tailivu, point, 233; province, 197, 205
 Taku, 378
 Talafaiva, 107
 Talasinga, 107 (plate), 125, 126, 235, 237
 Talau, 104
 Talisi, 689
 Tallow, 479
 Talomako, 584
 Tamana, 305, 317, 321; description, 379 (with fig.)
Tambua, 129, 157
 Tami, 5
 Tana, 514-7, 522-3 (plates), 529-31, 537, 539, 546, 554, 556, 560, 565, 572, 600; description, 601-2 (with fig.)
 Tanaiang village, 377-8
 Tanambuli, 680; bay, 680
 Tangaloo 'Eitumatupua, 38, 90
 Tangaloo, Polynesian god, 287; *see also* Tangaroa
 Tangaroa, Polynesian god, 275
 Tangoa, anchorage, 584; island, 582, 584, 585
 Tanimaiki village, 371
 Tanlé bay, 425, 432
 Tano'a, 102
 Tanoriki, 592
 Tao, 417, 427, 467
 Taom, 419
 Tapioca, 78
 Tarawa, 307, 312 (fig.), 339, 345-6, 358, 359, 361, 363, 373 (fig.); description, 372
 Tardy de Montravel, Governor, 487
 Taro, 4, 37, 78, 158, 270, 274, 280, 286, 293, 298, 314, 324, 336, 348, 454, 473, 502, 506, 524, 544, 620, 639, 670, 697
 Taroaniara, 654, 685
 Tasiko, *see* Epi
 Tasman, Abel Janszoon, 39, 93, 101, 128, 623, 668

- Tatafa, 99
 Tatakamotonga, 52
 Tauesurhlava, mount, 595
 Taufa'ahau (King Siaosi Tupou I),
see Tupou family
 Taufa'ahau Tupouto'a, *see* Tupou
 family
 Taula, 106
 Taumako group, 607, 632; description,
 695
 Taumako island, 623; description, 695
 Taunga, 107
 Taura, bay, 675; peak, 674
 Tauri river, 672
 Tauu, 611, 632; description, 668
 Tava ni Kutali, mount, 587
 Tavanaki, peak, 575
 Tavea Ndongu, 246
 Taveuni, 114, 116, 118, 119, 124, 127,
 128, 132, 135, 168, 225, 228, 229, 230,
 244 (fig.), 245 (fig.); description,
 251-2
 Tavewa, 256
 Tavua island, 242
 Tavua (Viti Levu), 222, 226, 228
 Tavuki bay, 250
 Tavuki isthmus, 250
 Tavunasithi, description, 263
 Tawoli river, 584
 Taxes, Fiji, 135, 175, 176, 197; Futuna
 (Hoorn), 299; Gilbert and Ellice is.,
 342; Lord Howe, 412; Nauru, 343;
 New Caledonia, 448, 458, 460; New
 Hebrides, 557; Norfolk, 403; Solo-
 mon is., 650; Tonga, 74, 75; Uvea
 (Wallis), 289
 Te Aonoanne district, 329
 Teapua, 103
 Te Ava i te Lape pass, 382
 Te Ava Mateika pass, 382
 Tebanda river, 428
 Tegua, description, 598
 Teisina, mount, 107
 Telegraphs, 216, 406, 495
 Telekitonga, 102
 Telektivava'u, 102
 Telephones, 90, 216, 229, 253, 363,
 366, 406, 489, 570, 572
 Te Loto lagoon, 381
 Temala river, 419
 Te Motu (Ndeni), 691 (plate), 693
 Temples, Hindu, 166
 Te Namo lagoon, 381
 Tendao islet (Vella Lavella), 635 (plate)
 Tenggano, lake, 612, 691
 Te Puapua pass, 382
 Tesman bay, 522 (plate), 580
 Tetipari, 676; description, 678
 Teuma river, 570, 576
 Tevai, 630, 659, 693, 694
 Thakaundrove island, 259
 Thakaundrove province, 132
 Thakombau, King, 42, 130, 131-3, 135,
 136, 211, 218
 Thikambia, 248
 Thikambia i Lau, 261
 Thio, delta, 429 (fig.), 491 (fig.); river,
 419, 430; roadstead, 433; settlement,
 451, 460, 466, 467, 490, 493, 495
 Thithia, description, 262
 Tholo West, province, 197; uplands,
 235
 Thomson, Basil H., 45, 72
 Thonoo range, *see* Mount Evans range
 Thousand Ships bay, 680
 Three Hills island, *see* Ermae
 Three Sisters islands, *see* Olu Malau
 Thurston, John Bates, 135, 136, 139
 Thurston, mount, 244
 Thuvu harbour, 240
 Tiebaghi, massif, 419, 425; mine, 466
 (plate), 470, 493
 Tika, 497, 500
 Tikituru range, 233
 Tikopia, 152 (plate), 287, 298, 324, 607,
 623, 625, 630, 632, 686 (plate);
 - description, 695-7 (with fig.)
 Tilingitha pass, 246
 Tillotson cove, 682
 Timber, 207, 566
 Timbichi harbour, 247
 Tin, 195, 635
 Tinakula, 518, 611; description, 693
 Tin Can island, *see* Niuafo'ou
 Tinpuas, 672
 Tiop harbour, 670, 672
 Tipindie river, 419, 427
 Titiana point, 679
 Tiwaka river, 419
 Toakira, 329
 Tobacco, 37, 82, 164, 274, 478, 567,
 626, 662
 Toddy, 328-9
 Tofua, 17, 28, 30, 31, 44, 98; de-
 scription, 103
 Toga, 526 (plate); description, 598
 Toiokh, 672
 Tokalau village, 151 (fig.)
 Tokelau group, 382
 Tokonako, 17
 Tokoriki, 242
 Tokovai lagoon, 677
 Toku, description, 108
 Toma harbour, 673
 Tomanivi, *see* Victoria, mount
 Tomatoes, 37, 349
 Tonga, 3, 8, 124, 129, 130, 133, 148,
 260, 270, 281, 283, 293-4, 528;
 general review, 14-90 (with figs. and
 plates); individual islands, 90-112
 (with figs.)
 Tonga Government Gazette, 54

- Tongan passage, 261
 Tongariki, 537; description, 586
 Tongatapu, 17, 21-2, 23 (plate), 30 (with plate), 31 (plate), 33 (figs.), 34, 35 (figs.), 36, 37, 39-40, 41, 44, 68, 70, 76, 78-9, 82, 83 (fig.), 86 (with fig.), 106 (plate); description, 90-3
 Tongatapu group, 14, 47, 51; description, 90-6
 Tongoa, 514, 518, 537, 554, 558, 572; description, 586
 Tonkinese, 450, 465, 507, 576, 580, 585, 588
 Tonnedou, delta, 430 (fig.); river, 431
 Tonnerre, cape, 425
 Tonolai harbour, 670, 671
 Tontouta river, 419, 423
 Tonua, 17
 Tonumea, 17, 44, 102
 Torres islands, 511, 515, 521, 539, 553, 559; description, 598-9 (with fig.)
 Tortoises, 38
 Totemism, 162, 275, 325, 331, 546
 Totongo creek, 219
 Totoya, 117, 256; description, 258 (with fig.)
 Touho, cape, 427, 428, 433; passage, 428; settlement, 451
 Toupéti island, 431
 Tovv island, 239
 Towers, The (Tours de Notre Dame), 427
 Towns, Robert, 530
 Tracks, 112, 226-7 (with fig.), 300, 412, 665-6
 Trade:
 General, 711-2; Fiji, 129, 131, 208-10 (with figs.), 214-5; Futuna (Hoorn), 300; Gilbert and Ellice is., 317, 356-9 (with fig.); Lord Howe, 411; Nauru, 356-9 *passim*; New Caledonia, 444, 463-6, 469, 471, 482-6 (with tables and fig.); New Hebrides, 566 (fig.), 567-8 (with fig.); Norfolk, 405; Rotuma, 276; Solomon is., 660-2 (with fig.); Tonga, 85; Uvea (Wallis), 290
 Exports, Fiji, 198, 201, 202-3 (with figs.), 204, 208-10 (with fig.); Futuna (Hoorn), 300; Gilbert and Ellice is., 351-2 (with fig.), 356-9 (with fig.); Lord Howe, 411; Nauru, 351-3 (with fig.); New Caledonia, 475-86 (with tables and fig.); New Hebrides, 563-4 (with figs.), 566-7 (with figs.); Norfolk, 405; Rotuma, 276; Solomon is., 656-61 (with figs.), 712; Tonga, 79-82 (with figs.); Uvea (Wallis), 289-90
 Imports, Fiji, 210 (with fig.); Futuna (Hoorn), 300; Gilbert and Ellice is., 358-9; Nauru, 358-9; New Caledonia, 484-6 (with figs.); New Hebrides, 567 (with fig.); Norfolk, 405; Solomon is., 661-2 (with fig.), 712; Tonga, 85
 Internal, Fiji, 210; Gilbert and Ellice is., 358; Nauru, 358; Solomon is., 662; Tonga, 85; Uvea (Wallis), 290
 Traders, 560-1; Chinese, 535, 662; European, 131, 133, 281, 317, 320, 448, 624, 626, 641; Indian, 164; mixed-blood, 131, 560
 Trade winds, 32, 119-21 (with fig.) 268-9, 279, 307-8, 434-5 (with figs.), 518 (fig.), 520-1, 614 (with fig.)
 Traitor's Head, 603 (with fig.)
 Treasury islands, 609, 611; description, 672-4 (with fig.)
 Treaties, *see under* names of countries
 Trochus shell, 207, 253, 254, 481-2, 560, 655, 659 (with fig.), 660-1
 Trois Sapins, cape, 428
 Truk, 2
 Tsarivonga river, 656, 689
 Tsiba peak, 424
 Tsinone, cape, 514 (fig.)
 Tuz (Tongan commoners), 61
 Tu'anuku, 106
 Tuberculosis, 75, 505, 557, 630
 Tu'i Ha'a Takalaua (Tongan title), 39, 60
 Tu'i Ha'a Teiho (Tongan title), 60
 Tu'i Kanokupolu (Tongan title), 39, 40, 41, 60, 64, 65, 93
 Tu'i Lakepa (Tongan title), 60
 Tui Nayau, 130, 133
 Tu'i Tonga (Tongan title), 38, 39, 41, 60, 61, 65
 Tu'i Tonga Tele'a, 107
 Tui Viti (King of Fiji), 132, 136
 Tuiyo, mount, 590
 Tuku'aho, Siaosi, 44
 Tulagi, 2, 614-5 (figs.), 616 (fig.), 618, 645 (plates), 649, 652, 665, 683; description, 662-3 (with fig.)
 Tung oil trees, 404, 658
 Tungi, Prince, 39, 46, 83
 Tungua, 102, 103
 Tupou College, 77
 Tupou family:
 King Siaosi, 133
 King Siaosi I, 41-5, 46, 52, 61, 72, 76, 103, 132
 King Siaosi II, 45, 46, 72
 Queen Salote, 15, 39, 60
 Taufa'ahau Tupouto'a, 47
 Turi, mount, 581
 Turtle bay, 582, 585
 Turtle island, *see* Vatos

- Turtles, 127, 264, 280, 316, 390, 443.
 482, 508, 577, 639
 Turtle shell ('tortoisehell'), 131, 626
 Tutuba; 582, 584
 Tuvatau, *see* Gordon, mount
 Tuvutha, 118; description, 262
 Two Hills island, *see* Mataso
 Typhoid, 76

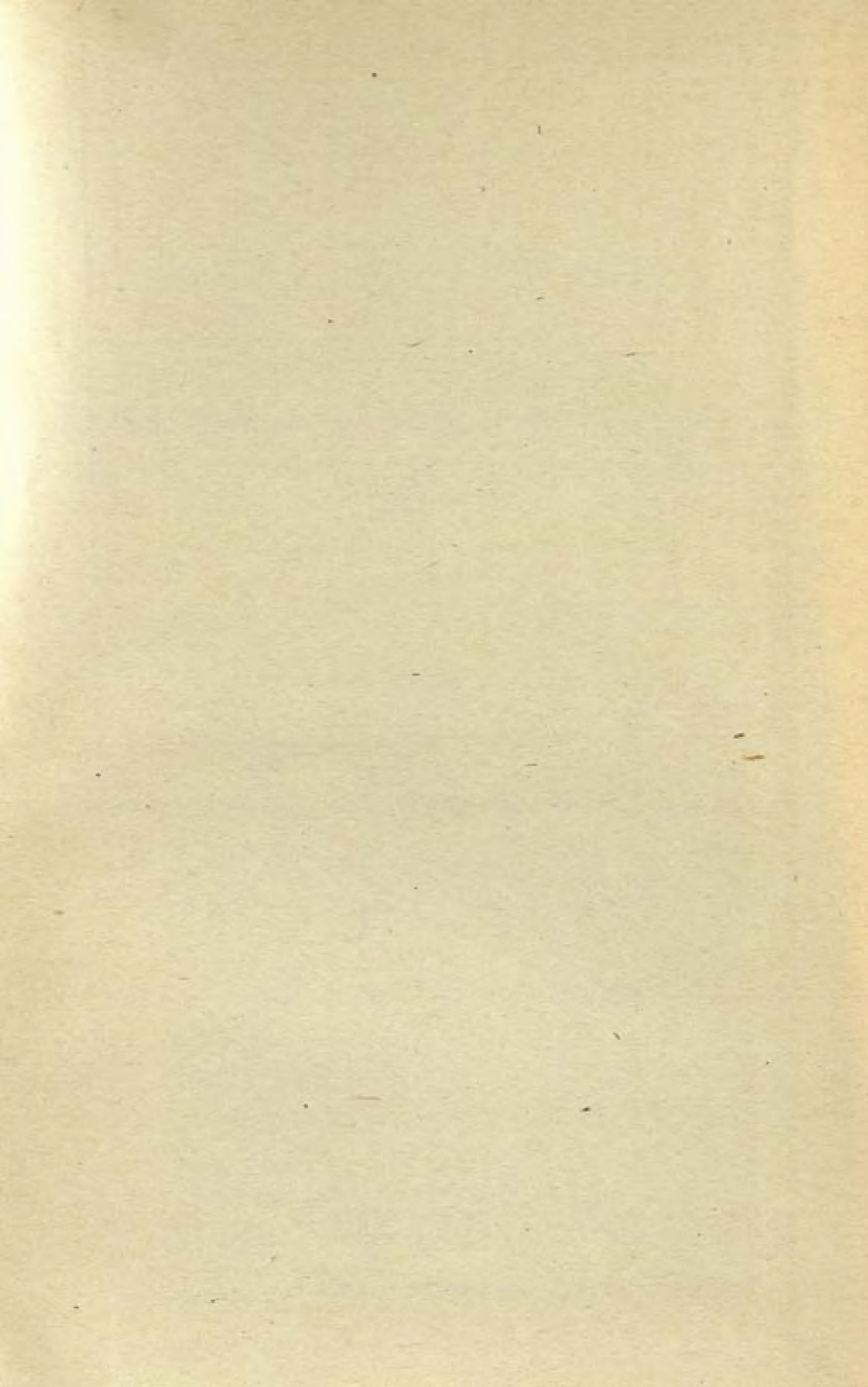
 Uarsai bay, 423, 432, 447
 Uea, 266-7
 Ueneti, 502
 Ugi, 609, 634 (plate), 652; description,
 691
 'Uiha, 31; description, 99
 Uitoe, port, 423, 432
 Ukiangong village, 371
 Ulawa, 634, 641, 683, 690; description,
 687
 Ulunasiva, 246
 Ulu i Ngalu peak, 251
 Ulundu peak, 233
 Uma, 329, 362, 368
 Umuna, 106
 Undine bay, 575
 Undui, 265
 Union Steam Ship Co. of New Zealand,
 89, 224
 United States:
 Exploring Expedition, 130, 260,
 270, 316, 390
 Government departments, 8
 Sovereignty, 7
 Trade, Fiji, 195; Gilbert and
 Ellice is., 357-8; New Caledonia,
 472, 485; New Hebrides, 567;
 Solomon is., 661; Tonga, 85
 Treaties, 43, 45
 Uo, 499
 Uoleva, description, 99
 Ureparapara, 526 (plate), 594; de-
 scription, 597
 Ureymus river, 577
 Uri, 577, 580
 Uripiv, 580
 Uru harbour, 686
 'Uta Vava'u, 21, 22 (plate), 23, (plate),
 30, 31, 33, 36, 37, 76, 87 (fig.), 88;
 description, 104-6 (with figs.)
 Utiroa, 378
 Utuha passage, 682 (plate), 683
 Utulei, 31 (plate), 107, 108
 Utungake, 106, 107
 Utupua, 607; description, 693
 Uvea (Loyalty is.), 442, 462, 495, 497,
 498, 505; description, 501-2 (with
 fig.)
 Uvea (Wallis), 3, 8, 298, 415, 492;
 description, 276-90 (with fig.)
 Uvea anchorage (Loyalty is.), 502
 Uverite point, 237

 Vaikeli, 34
 Vai Lahi, 111
 Vaileka, 221
 Vaipu'ua inlet, 22 (plate), 105
 Vaitupu, 324, 335, 337 (fig.), 338, 345;
 description, 381
 Vaitukakau, 105, 106
 Vaka'eiru, 107
 Vakola river, 585
 Valetui, 248
 Valua, *see* Mota Lava
 Vancouver-Fiji Sugar Co., 200
 Vancouver, island, 386; port, 2, 223, 227
 Van Diemen point, *see* Niuaunono
 Van Diemen's Land, 400
 Vangandathe creek, 219
 Vangunu, 655, 676, 677; description,
 678
 Vanihe bay, 593
 Vanukoro, 607, 623, 630, 659, 666; de-
 scription, 693-4
 Vanikoro Kauri Timber Co., 659, 664,
 694
 Vanilla, 478
 Vanua Kula, 250
 Vanua Laya, 517, 519, 560, 561, 594;
 description, 595-7 (with fig.)
 Vanua Levu, 114, 116, 118, 119, 124,
 127, 128, 130, 168, 194 (plate), 223,
 225, 228; description, 244-8 (with
 figs.)
 Vanua Mbalavu, 127, 128; description,
 260-1 (with fig.)
 Vanua Vatu, 263
 Vao, 544, 577, 580
 Vau relationship, 59, 153, 155
 Vatganai, 597
 Vatia Lailai, 239
 Vatia wharf, 222, 225
 Vato, Port, 590
 Vatoa (Turtle island), 128, 195; de-
 scription, 264
 Vatukoula, 222, 222-3 (fig.)
 Vatu Lele, 118 (plate); description, 242
 Vatu Vara (Hat island), 118; de-
 scription, 261
 Vatuwangga, 214
 Vava'u group, 15, 21, 23, 34, 39-42, 44,
 47, 51 (with table), 70, 76, 78, 83,
 88, 108; description, 104-7 (with
 figs.); *see also* 'Uta Vava'u
 Vava'u island, *see* 'Uta Vava'u
 Vegetables, *see* Market gardening, and
 under names of species.
 Vegetation, Fiji, 107 (plates), 124-7
 (with fig.), 153 (plate), 235, 252
 (plate); Futuna (Hoom), 293; Gilbert
 and Ellice is., 313-4; Kermadecs,
 388-9, 398; Lord Howe, 398, 408
 (plate), 409 (with plate), 410; Loyalty
 is., 498; Nauru, 315 (with plate), 332

- (plate); New Caledonia, 432 (plate), 438-42, 453, 498; New Hebrides, 522-24 (with plates), 526 (plate), 553 (plate), 577; Norfolk, 398-9 (with plates); Rotuma, 270; Solomon is., 577 (plates), 612 (plate), 613 (plate), 619-21, 670, 683 (plate), 690 (plate); Tonga, 22 (plate), 23 (plate), 36, 93, 95, 96; Uvea (Wallis), 280
- Veiongo, Lavinia, 60
- Veiongo (Fungasia), 90
- Veitalathangi point, 231
- Veivatuloa, 240
- Vella Lavella, 654, 658, 676, 682 (plate); description, 680
- Venui islet, 554, 571, 585
- Verao, 574, 575
- Veronica, H.M.S., 25
- Versailles Treaty, 319
- Victoria, mount (Tomaniivi), 233
- Vila, 2, 553 (plates), 554, 556-8, 576 (with plates); climate, 520 (fig.), 521 (fig.), 522; communications, 571, 572; history, 533; population, 535, 576; port, 519, 568-9 (with fig.), 575; town, 569-70
- Vila island, 553 (plate), 569
- Vina Kiki peak, 677
- Vina Roni peak, 676
- Vio island, 215-6
- Vipaka anchorage, 526 (plate), 598
- Viru harbour, 678
- Visale, 654
- Viti Levu, 107 (plates), 114, 115, 116 (fig.), 118, 119, 124, 125, 132, 135, 138, 148, 153 (plate), 158, 187, 194 (plate), 219 (plates), 223, 229, 252 (plates); description, 233-42 (with figs.)
- Viti Levu bay, 238, 241
- Viwa, 256
- Voh, river, 419, 424; settlement, 490, 494, 495
- Volivoli point, 241
- Vomo island, 242
- Vori point, 676
- Vouvouto cove, 424
- Vuangava, description, 264
- Vuimasia, 234
- Vulavu anchorage, 680
- Vulcanism:
- Banks is., 594, 596; Fiji, 115-8, 245 (fig.); Futuna (Hoon), 292; Kermadecs, 387, 391; Matthew and Hunter, 604; New Hebrides, 516-8, 586, 589-90, 592; Solomon is., 609 611, 670, 679, 685; Tonga, 15-21, 23-8, 103-4, 108
- Eruption, 17, 103, 110, 387, 589-90, 601
- Fumaroles, 111, 387, 393, 594, 596, 679
- Vulcanism (*continued*):
- Hot springs, 117, 292, 594, 595-6, 679
- See also Cones; Craters; Island types: Volcanic; Lava
- Vuna point, 251
- Vunda district, 195
- Vunmaramara anchorage, 592
- Vura anchorage, 684
- Vureas bay, 596
- Wagap, 433
- Wailangilala, 259
- Wailela bay, 246, 247
- Wailevu river, 245
- Waimanu river, 236
- Waindina river, 194 (plate), 234, 236
- Wainikoro river, 245
- Wainikoroilua river, 237
- Wainimala river, 236
- Wainimbuka river, 228, 236
- Wainunu, bay, 247; tableland, 244
- Wairotai bay, 685, 686
- Waitovu, 219
- Wakaya, 253
- Wake island, 2, 8
- Wala, 580
- Wallis, Captain Samuel, 39, 108, 110, 281
- Walpole island, 414, 465; description, 507-8
- Walpole, ship, 497, 691
- Walu bay, 212
- Walurigi, 593
- Wanawana island, 676; description, 679
- Wanawana lagoon, 679
- Wanderer bay, 689
- Wango bay, 690
- Wanoni bay, 689, 690
- War, 1914-8, 46, 318-9, 392, 404, 534, 627, 628
- Warfare:
- Melanesian, Fiji, 132, 161; Loyalty is., 505; New Caledonia, 457; New Hebrides, 552; Solomon is., 627-8 643
- Micronesian, Gilbert is., 326-7
- Polynesian, Fiji, 133; Futuna (Hoon), 296; Rotuma, 275; Tonga, 40, 48; Uvea (Wallis), 280-1
- Washington, cape, 250
- Washington island, 303, 318, 355
- Washington, mount, see Mbuke Levu
- Water supply, Fiji, 123, 124, 264; Gilbert and Ellice is., 313, 370, 377, 380; Loyalty is., 498; Nauru, 343; New Caledonia, 488, 490; New Hebrides, 569, 592; Norfolk, 398; Rotuma, 267; Solomon is., 695; Tonga, 58, 87, 89, 102, 108; Torres is., 598; Uvea (Wallis), 279-80, 289
- Watts, Lieut., 390
- Waugh bay, 678

- Weasisi bay, 601
 Wesleyans, *see* Methodists
 West bay (Pavuvu), 683
 Western Ha'apai group, *see* Lulunga group
 Western Pacific High Commission, *see* High Commissioner for the Western Pacific
 Western passage (Abemama), 374
 Whalebone, 445
 Whalers, 270, 316, 389, 391, 400, 410, 528, 624, 687
 Wharves, *see* Jetties, piers and wharves
 White Rock point, 595
 Whitesands, 522 (plate)
 Whitmee, Rev. J. S., 317
 Wickham anchorage, 678
 Wilbur, J., 532
 Wilkes, Captain Charles, 47, 130, 131, 270, 316, 317, 380, 390
 Williams, John, 529
 Williams river, 603
 Wilson group, *see* Taumako group
 Wilson, James (of the *Duff*), 695; *see also* *Duff*, mission ship
 Wilson point, 393
 Wireless Telegraph, Fiji, 216, 220, 229, 253; Futuna (Hoom), 300; Gilbert and Ellice is., 363, 381, 383; Kerma-decs, 392; Lord Howe, 412; Loyalty is., 507; Nauru, 363; New Caledonia, 489, 495; New Hebrides, 570, 572; Norfolk, 406; Rotuma, 276; Solomon is., 664, 666; Tonga, 87-90; Uvea (Wallis), 290
 Wolf, German raider, 392
 Woodford, C. M., 627, 628
 Woodford island, 677
 Woodford reef, 663
 Woodin channel, 421
 Woods, George Austin, 136
 Wool, 404, 567
 Wot rock, 587
 Wulei, 577
 Wus, 585
 Yale, mount, 249
 Yams, 4, 36, 78, 112, 158, 270, 280, 286, 293, 298, 454, 473, 506, 544, 639, 692, 697
 Yanawai, 195, 222, 248
 Yandé island, 425
 Yandina, 662
 Yandua, 248
 Yangasa cluster, 264
 Yangasa Levu, 264
 Yangganga, 246, 248
 Yanggeta, 256
 Yanggona, *see* Kava
 Yangor, 360, 366
 Yanuia, 265
 Yanuta island (San Cristobal), 690
 Yanutha island (Rambi), 248
 Yanutha island (Viti Levu), 241; description, 242-3
 Yanuya, 242
 Yarawa harbour, *see* Serua harbour
 Yasawa group, 114, 116; description, 255-6 (with fig.)
 Yasawa harbour (Vanua Levu), 247
 Yasawa i Lau, 116, 255
 Yasawa island, 255
 Yasur, volcano, 517, 523 (plate), 601
 Yaté, port, 431, 433; river, 419, 467, 491; settlement, 415, 447, 466, 491, 493
 Yathata, 118; description, 259
 Yauravu bay, 250
 Yavusa (tribe), 153-4
 Yaws, *see* Framboesia
 Yeharnu, 668
 Yora river, 527, 581
 Yovo, 668
 Ysabel, 607, 613, 622, 624, 627, 633, 636, 644, 647, 650, 658; description, 680-2 (with fig.)
 Yuvutha, 264
 Zinc, 195, 463, 465
 Zion (hill), Nuku'alofa, 52, 90





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